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Evaluation of an Adult Education Program

by

Marion Giles

(C)

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

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Date December 12, 1984

ABSTRACT

The purpose of this study was to determine the present quality of the University of Alberta's Horticulture Extension Program, by identifying its strengths and weaknesses. Specific program components assessed in this study were promotional strategies, time-scheduling, instructional formats, teaching techniques, subject content, and future course topics. Former students' opinions were collected with questionnaires, and structured telephone interviews. Student data from the study provided information for judging program effectiveness.

Stufflebeam's Context and Process evaluation models were useful organizers for the study. Recommendations for the program were determined from the Context and Process evaluation results. Major strengths in the program were the course location, promotional strategies, and teaching techniques. The University was highly rated by students as being very convenient and providing a comfortable and non-threatening class atmosphere. The current promotional strategies used by the University were rated by the students as being very effective communication channels; particularly effective was the newspaper advertising. Students were satisfied with the instructors choice of teaching techniques.

Weaknesses in the program were the instructional

formats used and the course content information. Students rated evening sessions once a week as being the strongly preferred instructional format, therefore this format should be adopted whenever possible. In terms of course information, it received moderate practicality ratings in all the courses. Since the students' strongest motivating factors for enrolling in the program were pragmatic, program effectiveness could be improved if course outlines were more flexible and open to revision by incoming classes.

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CHAPTER ONE

THE PROBLEM

1.1 INTRODUCTION

Evaluation is a valuable and essential process in the administration of adult education. Particularly in those programs where participation is voluntary, the effectiveness and survival of the educational activity depends upon an accurate assessment of the needs, attitudes and preferences of its current and potential clientele (Darkenwald, 1982:117-118). Thus, the University of Alberta's Faculty of Extension has initiated this evaluation of their Horticulture Extension Program in order to appraise the effectiveness of the program at present and maintain an effective and high quality of service to their adult learners.

1.2 DESCRIPTION OF THE HORTICULTURE EXTENSION PROGRAM

The Horticulture Program at the Faculty of Extension of the University of Alberta is by the Faculty as follows:

> The Faculty of Extension's general interest Horticulture program at the University of Alberta is designed to allow the beginner as well as the advanced amateur gardener to take advantage of the expertise offered by the University in this field. The program offers individual courses on many aspects of horticulture taught by instructors from the departments of Botany and Plant Science at the University of Alberta and Alberta Environment.

(Faculty of Extension, 1982)

The courses evaluated in this study are as follows.

	TITLE	DATES
1.	Beginning Gardening and Landscaping	Jan. 1982 Jan. 1983
2.	Control of Home and Garden Insect Pests	Oct. 1981 Oct. 1982
3.	Greenhouse Design, Construction and Management I	Oct. 1981 Oct. 1982
4.	Greenhouse Design, Construction and Management II	Jan. 1982 Jan. 1983
5.	How to Develop a Green Thumb with Houseplants	Mar. 1982
6.	Indoor Landscaping	Oct. 1982
7.	Introduction to Hydroponics	Oct. 1982

1.3 RATIONALE FOR THE STUDY

The Faculty of Extension's agriculture division's role in the educational process is to enhance the:

> development and utilization of scientific knowledge in agriculture, forestry, home economics, and extension education by facilitating 1) the dissemination, interpretation, and application of contemporary knowledge and 2) the identification of research and educational needs. (Lamble, 1983:2)

The Faculty of Extension has implemented these objectives by practicing objective and systematic program evaluations.

From a theoretical perspective, this evaluation of a continuing adult education program is significant because it provides additional information on the nature and

preferences of the adult learner, which can be used to assist in the development of new approaches to and conceptions of evaluation. Although evaluation studies tend to be specific and of a practical nature, they still provide a systematic accumulation of knowledge which acts as a foundation for broader theories of adult education. Thus, results from this evaluation study will hopefully provide the Faculty of Extension with meaningful information regarding their Horticulture program, and also contribute to the extant knowledge of the administration of continuing adult education programs.

1.4 STATEMENT OF THE PROBLEM

The problem that was addressed in this study was to determine what was the worth or quality of the Horticulture program offered by the Faculty of Extension of the University of Alberta for the Academic years 1980-1983. Specific program components assessed in this study were promotional strategies, time-scheduling, instructional formats, teahing techniques, subject content, and future course topics. Former student opinions were used to judge program component effectiveness. Recommendations for future Horticulture programs were made on the basis of information collected in the study.

1.5 DEFINITION OF TERMS

Adult Education: For purposes of this study, the UNESCO definition of Adult Education was used, as follows:

> Adult education is the entire body of organized educational processes, whatever the content, level and method, whether formal or otherwise, whether they prolong or replace initial education in schools, colleges, and universities as well as in apprenticeships, whereby persons regarded as adult by the society to which they belong develop their abilities, enrich their knowledge, improve their technical or professional qualifications or turn them in a new direction and bring about changes in their attitudes or behaviour in the twofold perspective of full personal development and participation in balanced and independent social, economic, and cultural development. (Unesco, 1980:3)

Evaluation: Evaluation was defined as "Systematic investigation of the worth or merit of an object, e.g. a program, project, or instructional material."(Joint Committee on Standards for Educational Evaluation, 1980:151)

Evaluation Role: Evaluation role was defined as: "The different reasons and circumstances for which an administrator needs to know the merit of something."(Stake, 1976:18)

Formal Education: Formal education was defined as:

> the highly institutionalized, chronologically graded and hierarchically structured "education system", spanning lower primary school and the upper reaches

of the University. (Coombs, 1974:8)

Formative Evaluation: Formative evaluation was defined as: "those evaluation roles which discover deficiencies, and successes in the intermediate versions of a new curriculum." (Scriven, 1966:20)

Informal Education: Informal education was defined as:

> the truly lifelong process whereby each individual acquires attitudes, values, skills, and knowledge from daily experience and the educative experiences and resources in his or her environment. (Coombs, 1973:10)

Nonformal Education: Nonformal education was defined as:

> any organized, systematic, educational activity carried on outside the framework of the formal system to provide selected types of learning to particular subgroups in the population, adults as well as children. (Coombs, 1974:8)

Program: A program ... a treatment method was defined as "an operational plan or directive (not necessarily detailed) for rendering some service." (Cronbach, 1982:2-3) In this study, the service was defined as a series of courses in horticulture.

Summative Evaluation:Summative evaluation was defined as: "general assessment of how effectively larger outcomes have been achieved over the entire course."(Scriven, 1966:20)

1.6 DELIMITATIONS OF THE STUDY

The experimentally accessible population used in this study consists of those adult learners who attended the Faculty of Extension's and the Faculty of Agriculture and Forestry's Horticulture program from October, 1981 to April, 1983. The Horticulture program emphasized urban horticultural issues. The administrative and teaching personnel interviewed for program objectives were limited to the horticulture course instructors, the extension assistant, and the program director in the Faculty of Extension's agriculture division.

1.7 LIMITATIONS OF THE STUDY

1. The data collection was conducted from, July to August, 1983.
2. There was one evaluator conducting the study.
3. The Horticulture program lacked behavioural objectives.
4. Assessment procedures for measuring student satisfaction were not consistent bet-

ween courses. The course evaluations used by the Faculty of Extension varied greatly in terms of specificity and frequency of use.

1.8 ASSUMPTIONS OF THE STUDY

1. An assumption was made that a target audience was not defined for the horticulture program.
2. In making recommendations, it was assumed that data collected on time scheduling preferences, and promotional strategies recorded for each course can be generalized to the overall horticulture program.
3. The experimentally accessible population came from a normally distributed population.
4. The courses in the program were grouped by subject content, not by the year they were offered.

CHAPTER TWO

REVIEW OF THE LITERATURE IN RELATED AREAS

Literature related to adult education programming and program evaluation is reviewed in this chapter. The first section reviews the current literature on adult education by emphasizing key concepts affecting the success of adult education activities. A background to program evaluation, and the major issues involved in conducting an evaluation study are discussed in the second section.

2.1 THE NATURE OF ADULT EDUCATION

Historically, the role of the adult educator was to provide successful programs for mature men and women, measuring success only on the basis of enrolment figures. However, recent changes in society have broadened the scope of adult education. Major influences such as a greater number of mature adults in proportion to the total population, the rising educational level of the populace, rapid technological change, and the knowledge explosion has caused practitioners to redefine the role of the adult educator. As Cross (1981:34) notes, the concern in adult education has shifted from that of simple recruitment (offering predetermined programs and finding students to

enroll in them) to serving adults (finding out what adults want and providing it). An even broader goal has been suggested by those adult educators who strive to promote lifelong learning concepts in their programs i.e. "helping individuals to develop the attitude that learning is a lifelong process and to acquire the skills of self-directed learning" (Knowles, 1980: 28). The nature of adult education is dynamic, with few restrictions or rigid guidelines as to subject area, age of participant, teaching techniques, measures of effectiveness and other factors in order to satisfy the varied needs and goals of adult learners, institutions, and society.

The diversity of the field of adult education is represented by a wide variety of learning opportunities in society. Educational experiences vary from independent study to formal, credit programs requiring mandatory participation. Boyle (1981:7-12) suggests that the large number of adult education programs offered by institutions can be summarized by the following typology:

1. A developmental program is one which is developed in response to explicit community needs. The administrator acts as a facilitator in the educational process by clarifying the problem and finding solutions to the problem. Its effectiveness is determined by how well the solution solves the problem.

2. An institutional program's major purpose is to impart the knowledge and expertise available in an institution to any individual interested in attaining

the knowledge. Unlike developmental programs, institutional programs are not initiated on the basis of expressed need, but are planned according to the knowledge base of the institution. In this type of program, effectiveness is determined by how well the client mastered the content or pre-specified competencies.

3. Informational programs are those programs which provide solutions to general societal problems by disseminating information about new research findings, new laws or regulations. The purpose of the adult educator is only to circulate information, not teach it. Standards of effectiveness are determined by the number persons reached and how much information was distributed.

A common concern of adult educators is to ensure satisfactory utilization of scarce resources, regardless of the type of activity being offered. Despite philosophical aspirations of the adult education profession, many adult education institutions must operate within financial constraints, particularly in those programs such as the Horticulture program, where the lifespan of the educational program is dependent on maintaining a cost-effective enrolment. Therefore, effective administrators strive to minimize those factors which deter participation and increase the use of facilitating factors.

As Bock (1980:127) explains, participation in educational activities are influenced by "an interplay of various personal and situational facilitators and barriers". Conflicts with time-schedules were found by Johnstone and Rivera (1965:17) and the Educational Testing

Service Surveys (in Carp et al, 1974:46) to be a significant situational barrier to participation in education programs. Cross (1978:20) concurs that scheduling is an important barrier for administrators to be aware of. However, she notes that the perception of scheduling as a major obstacle is often incorrectly cited as being due to a lack of scheduling alternatives, when the real reason is poor advertising of available alternatives.

A strong positive influence under the category of personal factors are those intrinsic characteristics of the individual adult learner, for example specific motives for learning. As Darkenwald (1982:75) and Cross (1981:141) indicate, the success of any program is strongly dependent on how well a program satisfies its participants' motives for engaging in the activity. One of the most influential and well-known motivational studies on the adult learner was conducted by Houle in 1961. He proposed that adults demonstrate one of the three following characteristic orientations to learning:

> The first, or as they will be called, the goal oriented, are those who use education as a means of accomplishing fairly clear-cut objectives. The second, the activity-oriented, are those who take part because they find in the circumstances of learning a meaning which has no necessary connection, and often no connection at all, with the content or announced purposes of the activity. The third, the learning oriented, seek knowledge for its own sake. (Houle, 1961:15-16)

Many other scholars such as Boshier (1976) and Tough (1968) have also studied the motives behind adult learng. Cross (1981:96-97) summarizes the current research on motivational research as being:

1. Houle's three-way typology of adult learners ... [provides] a reasonably good practitioner's handle for thinking about individual motivations for learning.

2. Most adults give practical, pragmatic reasons for learning.

3. Young people are primarily interested in education for upward career mobility; adults with a good job want a better one, and those without a good job want neew career options. Older people and those reaching career levels . . . are often interested in learning that will enhance the quality of life and leisure.

A broader and more comprehensive theory of adult learning was developed by Malcolm Knowles in 1967. His theoretical model is commonly known as "andragogy" i.e. the art and science of helping aduts learn (Knowles, 1980:43). Since 1978, Knowles has modified his stance on andradogy from being the only method for teaching adults to suggesting that it is "simply another model of assumptions about learners to be used alongside the pedagogical model [the art and science of teaching children] of assumptions" (Knowles, 1980:43). However, Knowles (1978:51) still believes that andragogy is a unifying theory for the diverse institutions, clienteles, and activities involved in adult education. The andragogy theory is based on the assumptions that as

individuals mature there are:

1. Changes in self-concept

   As persons grow and mature, their self-concept changes from one of total dependency to increasing self-directedness. A person becomes an adult when their self-concept is self-directed, and when he/she finds themselves in a situation (program) where they cannot be self-directed, they react in a resentful and resisting manner.

2. Role of Experience

   There is decreasing emphasis on lecture format of information transmission and an increase in emphasis on experiential techniques which draw upon the learner's experience.

3. Readiness to Learn

   As individuals mature, their readiness to learn is decreasingly the product of their physical development and academic pressure. Readiness to learn is more a product of the developmental tasks required for the performance of their evolving social roles. Thus, adult educators must ensure that learning experiences are timed to coincide with the learner's developmental tasks.

4. Orientation to Learning

   Adult orientation to learning tends to be problem-centered. Adults pursue further education

because they need assistance in coping with specific, current life problems. (Knowles, 1973:45-49)

Although Knowles' andragogy model is well-known and makes subjective sense, it has not been proven to be definitive. (Cross, 1981:227). However, Knowles' theory is beneficial because it highlights factors which appear to be significant to the operation of effective adult educational activities for adults that administrators may have overlooked. Thus, the general theme of the adult education literature is that administrators of adult education activities need to maintain a global perspective and treat their clients in a holistic manner by tailoring all aspects of the educational process to accommodate and satisfy the special learning requirements of the adult learner.

In summary, the administration of adult education requires a constant juggling of complex variables in order to ensure successful programs. Adult administrators must be well-informed and responsive to a public demanding new developments, better services, and improved products (Cross, 1981:250). However, as Harman (1976: 110-111) warns new efforts must be well conceived and executed by utilizing sufficient and relevant knowledge bases to ensure success. Thus, program evaluation becomes an indispensable process for enabling administrators to build an adequate knowledge base for improving program

effectiveness.

2.2 A BACKGROUND TO PROGRAM EVALUATION

The term "evaluation" connotes many types of inquiries. Evaluation is defined in Webster's Third New International Dictionary "as an act of appraisal". (1976:786) Such a broad interpretation implies that everyone is an evaluator of some sort. Informal evaluation is usually characterized by a subjective decision-making process which chooses alternatives only on the basis of perception (Worthen and Sanders, 1973:2). Instructors are often informal evaluators when they choose one teaching method over another because of an impressionistic, private, and subjective appraisal.

In contrast, formal evaluation does not rely only on subjective appraisals. Rather, formal evaluation requires making choices based on well-researched criteria, in order to provide a clear picture of the real worth of the alternative (Cronbach, 1982:2; Worthen and Sanders, 1973:2). Also, the formal evaluation process tends to deal with issues often clouded by political and social ramifications. A "formal" evaluator pursues knowledge for its practical, and extrinsic value (worth) to ensure that the results are useful for action (Guba, 1981: 40; Groteleuchen, 1980:81). In this study, the term "evaluation" denotes formal evaluations which are

systematic and logical inquiries designed to provide decision-makers with reliable and relevant information about their programs and clientele.

Historically, Tyler's (1942) eight-year study of secondary education is often cited as a milestone in the advancement of formal program evaluation. Tyler (1942: 5-10) contributed to evaluation theory by expanding the definition of evaluation beyond that of standardized testing to include an emphasis on the value of the program and to bring attention to behavioural objectives as major constructs in an evaluation design.

The next significant impact on evaluation theory was the launching of the Soviet "Sputnik" satellite in 1957. Americans blamed their educational system for not keeping America ahead of the Soviets in technological and scientific developments. The federal government's response was to pour funds into the educational system by introducing the Elementary and Secondary Act of 1965 (Borich, 1981:165; Patton, 1978:15). This Act provided hundreds of federal grants for developing new content, instructional methods, and educational research.

After Sputnik, theories on evaluation purposes and principles grew steadily. Tyler (1942), Scriven (1966), Stake (1967), Stufflebeam (1971), and Cronbach (1963) were among the main contributors in the furthering of

evaluation thought. Their theories emphasized what evaluators "should" accomplish, but lacked detail on the techniques required to conduct an effective program evaluation (Mackay and Maquire, 1971:10; Worthen and Sanders, 1973:7; Borich, 1981:170). Since the 1960's, the challenge for practical, "cookbook" evaluation models have been met by over 40 different extant frameworks (Guba, 1981:11).

The many models available in the literature can be a help and a hindrance to the evaluation profession. Variety is useful for ensuring a broad theoretical perspective, but it is also confusing and time-consuming to choose from such a large array of models. Also, there is a danger in overemphasizing model building, because it encourages evaluators to incorrectly match the ends to the means by adapting the evaluation objectives to fit a certain model. For any evaluation, there are many good designs, but no perfect ones (Cronbach, 1981:2). Evaluation models are only tools or guidelines which assist in clarifying appropriate investigation methods to a specific problem (Stake, 1981:83-84).

Therefore, it is the evaluator's responsibility to be aware of several models in order to build a comprehensive foundation which will assist in matching particular evaluation issues and the methodologies available for conducting the evaluation study. A systematic and

efficient way of reviewing the literature on evaluation models is to compare the underlying assumptions upon which the models are based (House, 1978:4) (see figure 1). Other authors, such as Stake (1978:28), Worthen and Sanders (1973:210-215); Morris and Fitz-gibbon (1978:7), have also summarized and compared evaluation approaches on the basis of the model's theoretical assumptions. Of the many extant models, prominent in the literature are Stake's Countenance model, Provus's Discrepancy model, Stufflebeam's CIPP model, and Stake's Responsive model (Borich, 1981; Morris and Fitz-gibbon, 1978; Guba, 1981; House, 1978).

2.3 EVALUATION ISSUES AND METHODOLOGIES

In the literature, several key evaluation issues are continually emphasized as being important to the success of any evaluation study. These issues are:

1. Determining the true purpose of an evaluation. Does the client want a needs assessment, a descriptive, information gathering process, formative evaluation only, or a summative and formative evaluation? (Bennett, 1982; Braskamp and Brown, 1980:91-98; Franklin and Thrasher, 1976: 92-118; Joint Standards Committee, 1981: 21-107; Stake, 1976:8)

2. Assessing the political implication of the evaluation results. Who are the key decision makers and "stake-holding" audiences. (Braskamp and Brown, 1980: 91-98; Cronbach, 1982:6; Guba, 1981:295-299, Stake, 1976:8)

FIGURE 1. A TAXONOMY OF MAJOR EVALUATION MODELS

Model	Proponents	Major Audiences	Assumes Consensus on	Methodology	Outcome	Typical Questions
Systems Analysis	Rivlin Provus	Economists managers	Goals, known cause & effect quantified variables	PPBS; linear programming; planned variation; cost benefit analysis	Efficiency	Are the expected effects achieved? Can the effects be achieved more economically? What are the most efficient programs?
Behavioural Objectives	Tyler, Popham Stake (1967)	Managers, psychologists	Prespecified objectives; quantified outcome variables	Objectives; achievement tests; surveys	Productivity accountability	Are the students achieving the objectives? Is the teacher producing?
Decision Making	Stufflebeam, Alkin	Decision-makers esp. administrators	General goals	Surveys, questionnaires, interviews; natural variation	Effectiveness; quality control	Is the program effective? What parts are effective?
Goal Free	Scriven	Consumers	Consequences; criteria	Bias control; logical analysis; modus operandi	Consumer choice; social utility	What are all the effects?
Art Criticism	Eisner, Kelly	Connoisseurs, Consumers	Critics, standards	Critical review	Improved standards	Would a critic approve this program?
Accreditation	North Central Association	Teachers, public	Criteria, panel, procedures	Review by panel; acceptance	Professional, acceptance	How would professionals rate this program?
Adversary	Owens, Levine, Wolf	Jury	Procedures and judges	Quasi-legal procedures	Resolution	What are the arguments for and against the program?
Transaction	Stake, Smith Rippey Parlett-Hamilton	Client Practitioners	Negotiations; activities	Case studies, interviews, observations	Understanding; diversity	What does the program look like to different people?

(adapted from House E. Assumptions Underlying Evaluation Models, 1978 and Morris and Fitz-gibbon, Evaluators Handbook, 1978)

3. Determining the role of the evaluator

   a. The relationship between evaluator and intended audiences.

   b. Ethical issues related to evaluator's relationship to the funding authority and program personnel.

   c. Evaluator as judge, juror, defendant, attorney, expert witness, detective or social worker? (Anderson and Ball, 1975:147-151; Braskamp and Brown, 1980:91-98; Cronbach, 1982:7)

4. Determining the resource limitations such as the evaluator's skill, time, financial resources, and the client's time and financial resources. Also, how available are the sources of data? (Grotuelechen, 1980:91; Morris and Fitz-gibbon, 1978:13; Joint Standards Committee, 1981:27-124; Stake, 1976:8)

5. Determining how results should be reported - progress reports, final presentation, informal feedback. What should the final report contain - full or partical disclosure, interpretive or just descriptive information? (Braskamp and Brown, 1980:91-98; Franklin and Thrasher, 1976:92-118; Morris and Fitz-gibbon, 1978:13; Joint Standards Committee, 1981:27-90; Stake, 1976:37)

Once the issues have been analyzed and resolved to the evaluator's satisfaction, the task of conducting the evaluation study begins. A general procedural design for an evaluation study has been drawn from the literature (Bennett, 1982; Franklin and Thrasher, 1976:44-90; Morris and Fitz-gibbon, 1978:69-105; Stake, 1976:31-50) and is summarized below.

1. Define the role of the evaluation study.

   a. Consider what clients expect the evaluation study to accomplish.

2. Formulate operational and precise evaluation questions.

a. Evaluators cannot expect to find precisely stated behavioural objectives in many educational programs. Therefore, it is the evaluator's responsibility to communicate effectively with the client to produce a list of operational, precisely stated objectives (Krathwohl, D.R. cited in Worthen and Sanders, 1973:266).

b. Ensure that the questions reflect the client's implicit and explicit expectations of the evaluation.

3. Select an extant evaluation model and adapt it to the particular evaluation study.

4. Plan the method of data collection and data analysis. Consider a variety of techniques which are suitable to the program clientele and subject content.

5. Administer data collection instruments and analyze data.

6. Draw conclusions and report evaluation results.

CHAPTER THREE

DESIGN OF THE STUDY

This section discusses the research stages, theoretical evaluation perspective, data collection procedures, instrumentation and appliction of the CIPP model to the Horticulture Program evaluation.

3.1 THEORETICAL EVALUATION PERSPECTIVE

This evaluation has both formative and summative components. Although the horticulture courses being evaluated were measured on their past effectiveness (summative approach), the former students also provided useful baseline data for improving future programs (formative approach). Therefore, a general theoretical perspective such as Werner's (1984:21) ends-means interpretation of the evaluation process was used as an organizing paradigm. In order to establish the relationship between the program means and ends, the evaluation relied on a combination of quantitative and descriptive measures.

Stufflebeam's CIPP (Context, Input, Process, Product) model was used to conceptualize and organize this evaluation. There were several key characteristics in the

model which made it very appropriate and useful. For example, the model's underlying assumption regarding the evaluation process was congruent with the purpose of this evaluation, i.e. the evaluator assisted the University of Alberta in improving their future horticulture programs by providing them with relevant, reliable, and valid information about their students' attitudes towards past horticultural courses and their preferences for future offerings.

Also, the CIPP model was sufficiently flexible and broad in scope to accommodate the many facets involved in the evaluation of adult education programs. Criteria for success in adult education programs include factors such as situational, personal, and physical barriers, how relevant and practical the subject content is, the effectiveness of an organization's promotional strategies, and the numerous and varied motives adults have for participating in adult education programs. The theoretical basis of the Horticultural evaluation is further clarified in the following section which summarizes the CIPP model.

CIPP MODEL

Stufflebeam's model was developed on the premise that evaluations should provide decision makers with important information for improving educational programs.

He states (1971:39) that:

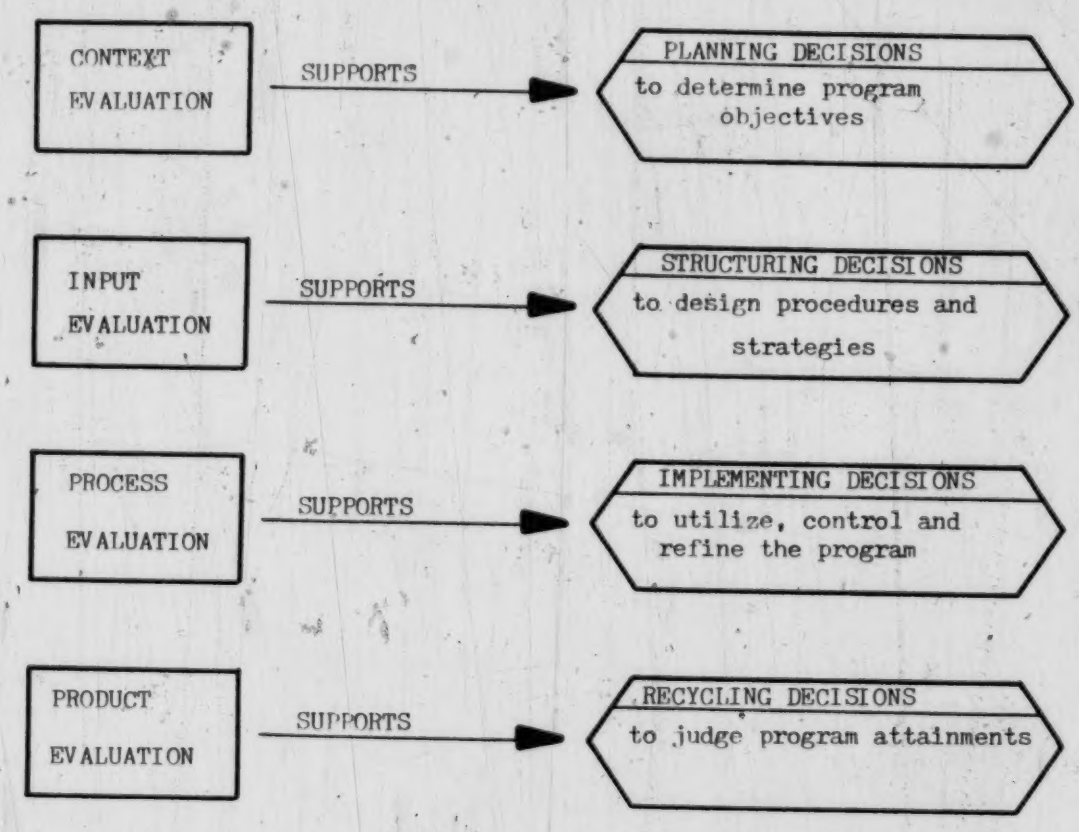
> ... to improve education the educational decision maker must identify alternative actions and choose that one or that combination giving the greatest probability of improved practice. The decision making process is thus of greatest interest to the evaluator, it is in providing information to inform such choices that the evaluator relates most effectively to education.

The types of evaluation information an evaluator provides depends upon the type of decisions required and the stage of the evaluation process. As Stufflebeam (1971:40) explains, educational evalution is a process which involves a series of three steps: "delineating, obtaining, and providing useful information for judging decision alternatives".

These steps are a fundamental process which occurs in any evaluation study regardless of the type of decision the evaluation is serving. Furthermore, Stufflebeam describes these steps as being interdependent processes and functioning in a circular manner. Another significant point in Stufflebeam's evaluation theory is that although the act of judging is integral to the evaluation definition, the evaluator does not participate in the judging process, otherwise the objectivity of the study becomes jeopardized.

A more detailed inspection of Stufflebeam's CIPP model demonstrates the close relationship between decision making and evaluation. The acronym CIPP represents the four types of evaluation (Context, Input, Process, Product) which Stufflebeam (1971:80-84) had identified as being necessary to serve four different types of decision stages. These are set forth in Figure 2). Context evaluation focusses on identifying and appraising needs in a system, describing the operational context, and deteining any problems that may obstruct needs and opportunitites from being fulfilled. Context evaluation functions as a monitoring system for administrators by providing current baseline data. Also, context evaluation provides a basis for change within a specific environment by diagnosing unmet needs and unused opportunities. Context evaluation relies on two complementary approaches, contingency and congruency evaluations. The contingency approach seeks out new directions or opportunities for the system from external sources. Some of the activities involved in a contingent evaluation could be study visits to other systems, secondary analysis, brainstorming retreats, and making projections about future needs and trends. In contrast, a congruence approach focusses on internal forces by assessing the degree of discrepancy between objectives and performance.

Figure 2. Decision Stages With Corresponding Evaluation Types (information from Stufflebeam, 1971:218 no copyright involved)



Input evaluation differs from context evaluation's systematic and macroanalytic approach by using adhoc and microanalytic techniques (Stufflebeam, 1971:223). The information from an input evaluation is used to identify optimum methods for utilizing resources to meet program goals. Information which is obtained from input evaluations are alternative designs for assessing staffing, time, and budget requirements, potential procedural barriers, relevance of designs to program objectives, and overall potential of the design to satisfy the objectives. The specific methodology used in input evaluation varies according to how much change existing programs require, and what degree of information is available to support the change. Examples of typical questions asked in input evaluation are: are the intended objectives stated operationally, and is their realization feasible? Can a given strategy be translated into an efficient procedural plan? What specific schedule of events and activities can guide the strategy's implementation? Once input information is established, it is evaluated by determining the relevant capabilities of the responsible agency, the strategies for achieving program goals, and the designs for implementing a selected strategy.

After the program plans are completed and the program has begun, process evaluation provides periodic feedback

to persons responsible for implementing plans and procedures. Thus, process evaluation detects or predicts defects in the procedural design and its implementation, provides information for programmed decisions, and records procedural information. Process evaluation is a three-stage operation to:

1. Identify and monitor continuously the potential sources of failure in a project.

2. Projecting and servicing preprogrammed decisions to be made by project managers during the implementation of a project.

3. Describe what actually takes place. (Stufflebeam, 1971:229-230)

Finally, product evaluation examines how well objectives have been or are being attained. Product evaluation includes devising operational definitions of objectives (delineating step), measuring criteria associated with the objectives of the activity (obtaining step), comparing these measurements with predetermined absolute or relative standards (obtaining step), and making rational interpretations of the outcomes using the recorded context, input, and process information to determine whether the chosen alternative did meet expectations for it (providing step) (Stufflebeam, 1971:232).

In sum, the CIPP model is a decision-making tool which involves four evaluation stages - Context, Input, Process, and Product. Within each stage the evaluation

process is divided into three steps: delineating, obtaining, and providing information about a program's worth. The CIPP model is useful to evaluation theory because it is practical, systematic and rational. Also, the model is easily operationalized, although utilizing all four stages would be very expensive. Fortunately, the CIPP model allows for partial operationalization of the model. Any one of the four stages can be conducted without the others.

3.2 RESEARCH QUESTIONS

1. Identify the Faculty of Extension's and the Faculty of Agriculture and Forestry's implicit and explicit objectives for the Horticulture program.

    a. What were the desired knowledge outcomes of the Horticulture program?

    b. What were the desired skill outcomes of the Horticulture program?

    c. What were the desired attitudinal outcomes of the Horticulture program?

2. Identify alternative promotional strategies, time schedules, instructional formats, and teaching techniques which students indicated were effective.

    a. Which promotional strategies were effective when communicating information to adults interested in learning more about horticulture?

    b. Which instructional formats, time schedules, and teaching techniques are preferred by adults interested in horticulture courses?

3. Determine what students' opinions were on the advertising and promotional strategies, time

scheduling, teaching strategies, course locations and subject content used in the Horticulture program.

a. Were there any major differences between the actual teaching techniques used in each course and students' preferred method of teaching?

b. How well were students' reasons for coming to the course met by the course content?

c. How satisfied were the students with the advertising and promotional strategies, time scheduling, instructional formats and techniques, course locations and subject content used in the Horticulture program.

4. Identify any additional horticultural topics upon which students would like to receive information.

5. Make recommendations for improving the University of Alberta's Horticulture program.

a. How might the Horticultural course content better meet the expectations and needs of their clientele?

b. Which advertising and promotional strategies should be used to communicate information to adults interested in Horticultural information?

c. Which teaching techniques, time schedules and instructional formats should be emphasized?

3.3 DATA COLLECTION PROCEDURES

The data collection instruments used in the study were a questionnaire with closed and open-ended questions, and structured personal and telephone interviews (see Appendices 1 & 2). The questionnaire guaranteed effective confidentiality, i.e. the questionnaire was numbered to

facilitate the following up of non-respondents, but only the evaluator knew who returned their questionnaire. Also, a covering letter signed by the evaluator and a self-addressed return envelope was included with the questionnaire. Three weeks after the initial questionnaire was sent follow-up letters with a duplicate questionnaire and a self-addressed return envelope were sent to non-respondents. Telephone interviews were conducted without notifying the students prior to the interviews.

3.4 SAMPLING STRATEGIES

A number of sampling strategies were used to collect all the necessary data. The main objective was to ensure a maximum representation of student opinions. One of the constraints in the study was that some students had attended more than one course. The decision was made to limit student response to only one course regardless of how many they had taken. The criterion used for elimination was: the lower the course enrollment, the higher the priority for asking students in that course to complete a questionnaire for that course. For example, if a student had enrolled in course A with 30 students and course B with 10 students, they would receive a

questionnaire dealing with only course B. After separating out students who had enrolled in several courses, randomly selecting four respondents for pilot-testing the questionnaire, randomly selecting two interviewees for pilot-testing the telephone interviews and twelve respondents for the telephone interviews, a total of one hundred and seventy students were sent questionnaires.

The twelve respondents chosen for the telephone interviews were selected using a judgment sampling strategy such that several courses with different subject contents were represented. Also, one instructor was chosen from each course to participate in personal interviews with the evaluator. If there were more than one instructor responsible for the course, the one who had the greatest responsiblity for the course was selected to be interviewed.

3.5 INSTRUMENTATION

Data collection instruments were:

1. A questionnaire with closed and open questions for research questions #2, #3, and #4.
2. Documentary research for research question #1.
3. Structured personal interviews for research question #1.

4. Structured telephone interviews for research questions #2 and #3.

The questionnaire was reviewed by experts in the field of adult education and evaluation, and then pilot-tested with a small random sample from the experimental population. The structured telephone interview schedule for the students was pre-tested on a small random sample of horticulture students.

3.6 APPLICATION OF THE MODEL

The organizing theme of this evaluation was to collect information from past participants for improving future programs. The objectives in this study correspond with Stufflebeam's Context and Process Evaluations. The Context evaluation was operationalized as a needs assessment which would provide baseline data for (a) options in promotional techniques, (b) a better understanding of students' motives for enrolling in the program so future programs could have a more definite focus, (c) time schedules which were suitable for their students, and (d) greater variety and better targetted course topics. The Process evaluation measured how successful the course was in meeting students'

expectations and weaknesses in teaching techniques and course content.

Planning charts follow which describe for each research question (a)the evaluation questions which were used in the student questionnaire and instructor interviews, (b)an explanation of how these questions evaluated certain issues, and (c)the procedures used for analyzing the data from corresponding questions.

CHART 1: PLANNING CHART FOR RESEARCH QUESTION #1

RESEARCH QUESTION #1: Identify the Faculty of Extension's and the Faculty of Agriculture and Forestry's implicit and explicit objectives for the Horticulture program.

EVALUATION QUESTIONS	EXPLANATORY NOTES	ANALYSIS PROCEDURES
(a)What were you expecting students to get out of the course, in terms of course content, skills, and attitudes? b)What indicators did you use to determine how satisfied students were with the course? (c)Briefly describe the teaching techniques used in the course. (d)In your opinion, what are some of the weaknesses in the Horticulture program? (e)In your opinion, what are the strengths of the Horticulture program?	The information from the personal interviews was used to develop a comprehensive knowledge base. Once the data were analyzed and priorized, measurable objectives were proposed for the evaluation study. These objectives were then approved by the client.	All the data were collated and sorted according to how often and how much emphasis an issue was given by the instructors. Those issues which were of most concern to decision makers were incorporated into the mail out questionnaires.

CHART 2: PLANNING CHART FOR RESEARCH QUESTION #2

RESEARCH QUESTION #2: Identify alternative promotional strategies, time schedules, instructional formats, and teaching techniques which students indicated are effective.

EVALUATION QUESTIONS	EXPLANATORY NOTES	ANALYSIS PROCEDURES
(a)How effectively do each of the following promotional techniques inform you about new horicultural courses?	Students evaluated ten different promotional strategies on a scale of 1(not effective) to 5(very effective). Those categories which were frequently evaluated as not effective could be signs of a restrictive advertising campaign i.e. many potential participants were overlooked.	Frequency counts for each course were calculated. One-way Analysis of Variance (ANOVA) and Scheffe Post-Hoc Pairwise Contrasts were used to determine if there were any significant differences in effectiveness among the promotional techniques.
(b)How did you first learn about the course?	The promotional techniques which were in current use were compared to the effectiveness scale developed in research question #2(a).	Frequency counts were made for each answer in this question. Current promotional techniques were evaluated using a comparative analysis.

CHART 3: PLANNING CHART FOR RESEARCH QUESTION #2

RESEARCH QUESTION #2 con't: Identify alternative promotional strategies, time schedules, instructional formats, and teaching techniques which students indicated are effective.

EVALUATION QUESTIONS	EXPLANATORY NOTES	ANALYSIS PROCEDURES
(c) Which months of the year are not practical for you to attend horticultural courses?	The months of the year indicated by the students as "not practical" are used as a standard for evaluating current practices.	Frequencies were calculated for each month and used to develop an annual profile of students preferences.
(d)If you were to attend another horticultural course, how preferable for you is each of the following formats?	Students evaluated nine different instructional formats on a scale of 1 (not preferred) to 5(strongly preferred). The data from this question was useful for predicting how successful alternative instructional formats would be.	The number of responses in each category were summarized over the whole program. An ANOVA was used to determine if there were any significant differences in the degree of preference for the various instructional formats.

CHART 4: PLANNING CHART FOR RESEARCH QUESTION #2

RESEARCH QUESTION #2 con't: Identify alternative promotional strategies, time schedules, instructional formats, and teaching techniques which students indicated are effective.

EVALUATION QUESTIONS	EXPLANATORY NOTES	ANALYSIS PROCEDURES
(e)How much should each of the following teaching techniques be used in the course?	A variety of teaching techniques are identified and evaluated according to how often students would prefer them to be used in the classroom. The results from this question are also used to evaluate students current teaching practices.	The mean frequency was calculated for each course and question. The means were used to rank techniques from "used often" to "not used". Anova was used to determine any significant differences among the teaching techniques.

CHART 5: PLANNING CHART FOR RESEARCH QUESTION #3

RESEARCH STAGE #3: Determine students' opinions on the advertising and promotional strategies, time scheduling, teaching techniques, course locations, and subject content used in the Horticulture program.

EVALUATION QUESTIONS	EXPLANATORY NOTES	ANALYSIS PROCEDURES
(a)If you did not attend all the sessions [in this course], circle all the applicable reasons below. [course location, time scheduling, subject content, teaching methods, other]	Those options which have a high frequency rate could be considered problematic areas.	Frequency counts were calculated for students' responses.
(b)What are your opinions about the course?[promotional strategies] (i)The course material was what I expected when I enrolled in the course. (ii)I would recommend this course to a beginning gardener.	A 5-point type Likert type scale was used to establish students' opinions on how accurately the advertising material described the courses. Students evaluated the statements on the basis of five criteria: (0)No opinion, (1)Strongly Agree, (2)Agree, (3) Disagree, (4) Strongly Disagree.	For each category, the frequency of response was calculated (excluding the No Opinion category) and used to evaluate how well the courses met the students' expectations.

CHART 6: PLANNING CHART FOR RESEARCH QUESTION #3

RESEARCH QUESTION #3 con't: Determine students' opinions on the advertising and promotional strategies, teaching techniques, time scheduling, course locations, and subject content used in the Horticulture program.

EVALUATION QUESTIONS	EXPLANATORY NOTES	ANALYSIS PROCEDURES
(c)What are your opinions about the course? [teaching techniques] (i)Students were encouraged to share their horticultural experience with the class. (ii)The instructor's presentation was easy to follow. (iii)There was enough class participation. (iv)Attending class was a relaxing experience.	A 5-point Likert type scale was used to establish the students' opinions on how accurately the advertising material described the courses. Students evaluated the statements on the basis of five criteria:(0)No opinion, (1)Strongly Agree, (2)Agree, (3)Disagree, (4)Strongly Disagree.	The number of responses in each category were counted (excluding the No opinion category), and used to develop a profile of how instructional techniques rated.
(d)In your opinion, how often were each of the following teaching techniques used?	Students opinions about the current teaching techniques were obtained by having students rate them from (1)not used, (2)too little, (3)just right, to (4)too often.	The number of responses were calculated for each course. A summary of the responses in each course was developed describing students' opinions on instructors choice and emphasis of teaching techniques.

Chart 7: PLANNING CHART FOR RESEARCH QUESTION #3

RESEARCH QUESTION #3 con't: Determine students' opinions on the advertising and promotional strategies, teaching techniques, time scheduling, course locations, and subject content used in the Horticulture program.

EVALUATION QUESTIONS	EXPLANATORY NOTES	ANALYSIS PROCEDURES
(e)How adequate was the total time scheduled for the course material?	Students rated the time scheduled for each course using discrete categories such as (1)adequate, (2) too much time, (3)not enough time. This data provides insight into how effectively instructors have matched subject content with teaching methods.	The number of responses was calculated for each category.
(f)What are your opinions about the course location? (i)The classroom was in a convenient location. (i)Coming to the University was not a threatening experience.	A 5-point Likert type scale was used to establish the students' opinions on the location chosen for the course. Students evaluated the statements on the basis of five criteria:(0)No opinion (1) Strongly Agree, (2)Agree (3)Disagree, (4)Strongly Disagree.	Frequency counts for each category were calculated for each category (excluding the No Opinion category) and organized into a profile describing students attitudes towards coming to the University and particular buildings used on the

CHART 8: PLANNING CHART FOR RESEARCH QUESTION #3

RESEARCH QUESTION #3 con't: Determine students' opinions on the advertising and promotional strategies, teaching techniques, time scheduling, course locations, and subject content used in the Horticulture program.

EVALUATION QUESTIONS	EXPLANATORY NOTES	ANALYSIS PROCEDURES
(g)How much did each of the following reasons influence you to take the course? [8 reasons were identified]	The subject content was evaluated as to how interesting the course content was to the student. Criteria for measuring the student's interest level in the subject content were: (i)how new the information was; newness was considered to be enough to satisfy those students who came primarily for a general interest course in horticulture, (ii)how often students refer to the information they received from the course; usefulness was a good indication of the relevancy and long term benefits for those students who expected the course to solve specific horticultural problems.	Frequency counts and means were calculated for each question. An ANOVA was calculated to compare the means of all the courses to determine if any course was significantly different from the other courses. A profile of student motives was developed by ranking the means found in question (1). How well the subject content met students' motives for attending a particular course was established by a descriptive comparison between students' motives for attending the courses and how well the courses rated in terms of newness and practicality.
(h)How new to you was the course information on each of the following topics? [12-14 subject areas were identified]		
(i)How often do you refer to the information taught in each of the following topics? [12-14 subject areas were identified]		
(j)Did you meet your objectives for taking the course?		

CHART 9: PLANNING CHART FOR RESEARCH QUESTION #3 and #4

RESEARCH QUESTION #3 con't: Determine students' opinions on the advertising and promotional strategies, time scheduling, teaching techniques, course locations, and subject content used in the Horticulture program.

EVALUATION QUESTIONS	EXPLANATORY NOTES	ANALYSIS PROCEDURES
(k)What are your opinions about the course? [subject content] (i)The course material was not too technical. (ii)The course provided me with practical information.	A 5-point Likert type scale was used to establish the students' opinions in the courses Students evaluated the staements on the basis of five criteria: (0) No opinion, (2)Agree, (3)Disagree, (4)Strongly Disagree.	Frequency counts and means were calculated for each item. An ANOVA was used to determine if any specific course was too technical, or not providing students with enough practical information.

RESEARCH QUESTION #4: Identify any additional horticultural topics students would like to receive information on.

EVALUATION QUESTIONS	EXPLANATORY NOTES	ANALYSIS PROCEDURES
(a)Please use the following space to suggest other horticultural topics you would like information on. (b)What topics would you add to the list [of subject areas] in the above question?	The information in this objective was collected to broaden the existing list of horticultural topics offered by the Faculty of Extension.	Topics were organized into major categories and ranked from highest to lowest frequency.

CHART 10: PLANNING CHART FOR RESEARCH QUESTION #5

RESEARCH QUESTION #5: Make recommendations for improving the University of Alberta's Horticulture program.

EVALUATION QUESTIONS	EXPLANATORY NOTES	ANALYSIS PROCEDURES
	The University Alberta's current practices will be assessed on the basis of data collected from the student questionnaires and telephone interviews .	

TELEPHONE INTERVIEWS:

Structured telephone interviews were used to expand upon the information received from the student questionnaires. Areas which the interviews focussed on were subject content, instructional techniques, and general opinions about the course.

CHAPTER FOUR

DISCUSSION AND FINDINGS OF THE STUDY

4.1 METHOD OF ANALYSIS:

This chapter summarizes the data collected with respect to the specific program components. Data were sought from program students and instructors. The questionnaire return rate varied among the courses. Of the 170 students in the program, 83(49%) responded to the first mail-out with 26(15%) additional responses from the follow-up questionnaires. The total questionnaire response rate was 64%.

The evaluation results in this chapter are presented in two sections. The first section summarizes the program data while the second section presents data from the individual courses. The components assessed in the first section are promotional technique effectiveness, time-scheduling preferences, instructional format preferences, teaching techniques preferences, and suggestions for new horticultural course topics. Course data in the second section is summarized and discussed under the following headings:

1) Frequency distribution of the possible reasons which influenced students to be absent from class.

2) Students' assessment of how accurately the advertising portrayed the actual course material.

3) Students' opinion on the time allotted for

the subject material covered in the course.

4) Students' assessment of specific teaching methods used in the course.

5) Students' opinions on course location.

6) Analysis of students' motives for enrolling in the course.

7) An assessment of how effectively the students' expectations for attending the course were met by analyzing how intereting and practical the subject content was, and by summarizing students' comments on how the course did not meet their expectations.

The data have been organized such that tables with interview data will be specified as such, and all other tables will only contain data collected by the questionnaires. Also, Analysis of Variance (ANOVA) tests were used in the program and course results to determine if the differences between the variables were statistically significant. If the ANOVA indicated significant differences between the variable (Fprob.<.05), then a Scheffe Post Hoc Comparison was conducted to determine which groups were significantly different from the rest. Since the Scheffe Post Hoc Comparison is a conservative test, a probability level of 0.1 was used as a standard for determining significant differences.

4.2 PROGRAM RESULTS

An analysis of the effectiveness of the promotional techniques used to attract students to the courses in the Horticulture program will be found in Table 1. A grading scale was computed using the values ($\bar{x}$=1) "not effective technique" to ($\bar{x}$=5) "very effective technique" in informing students about horticultural programs.

TABLE 1

ANALYSIS OF PROMOTIONAL TECHNIQUE EFFECTIVENESS

Technique	Frequency	Mean	Grading Scale
Newspapers	108	3.72	Very effective ($\bar{x}$=5)
Brochures	105	3.50	
University Folio	104	2.50	
Friends/neighbours	105	2.36	
Radio	105	1.91	
Horticulture Clubs	97	1.71	
Garden Centres	106	1.71	
Television	106	1.48	
Shopping Centre Bulletin Board	104	1.26	Not effective ($\bar{x}$=1)

* Analysis of Variance reveals an F Ratio of 57.82, $p<0.000$

A further comparison of effectiveness of promotional techniques, using a Scheffe Post Hoc Comparisons procedure with the various techniques, will be found in Table 2.

TABLE 2

COMPARISON OF EFFECTIVENESS BETWEEN PAIRS OF TECHNIQUES

PROMOTIONAL TECHNIQUE	Shopping Centre Bulletin Boards	Television	Garden Centres	Horticulture Club	Radio	Friends/neighbours	University Folio	Brochures	Newspapers
Shopping Centre Bulletin Boards									
Television									
Garden Centres									
Horticulture Club									
Radio	*								
Friends/neighbours	*	*	*	*					
University Folio	*	*	*	*					
Brochures	*	*	*	*	*	*	*		
Newspapers	*	*	*	*	*	*	*		

*denotes significantly different Scheffe Post Hoc comparisons existing between the pairs of techniques at a ($p<0.100$) level.

The distinction between the two most effective promotional techniques, brochure and newspaper, was determined in Table 3 by analyzing how students' first learned about the course. The data in Table 3 indicate that 65% of the students found newspapers as being the first information source, and only 14% indicated brochures as the first information source.

TABLE 3

HOW STUDENTS FIRST LEARNED ABOUT THE COURSE
(N=104)

	N	% of Response
Newspaper	68	65%
Brochure	15	14%
Personal Inquiries	11	11%
Informal Network	8	8%
Folio	2	2%

Table 4 sets forth the distribution of the months students find convenient for taking courses. January to April and September to December were found to be optimum for scheduling courses.

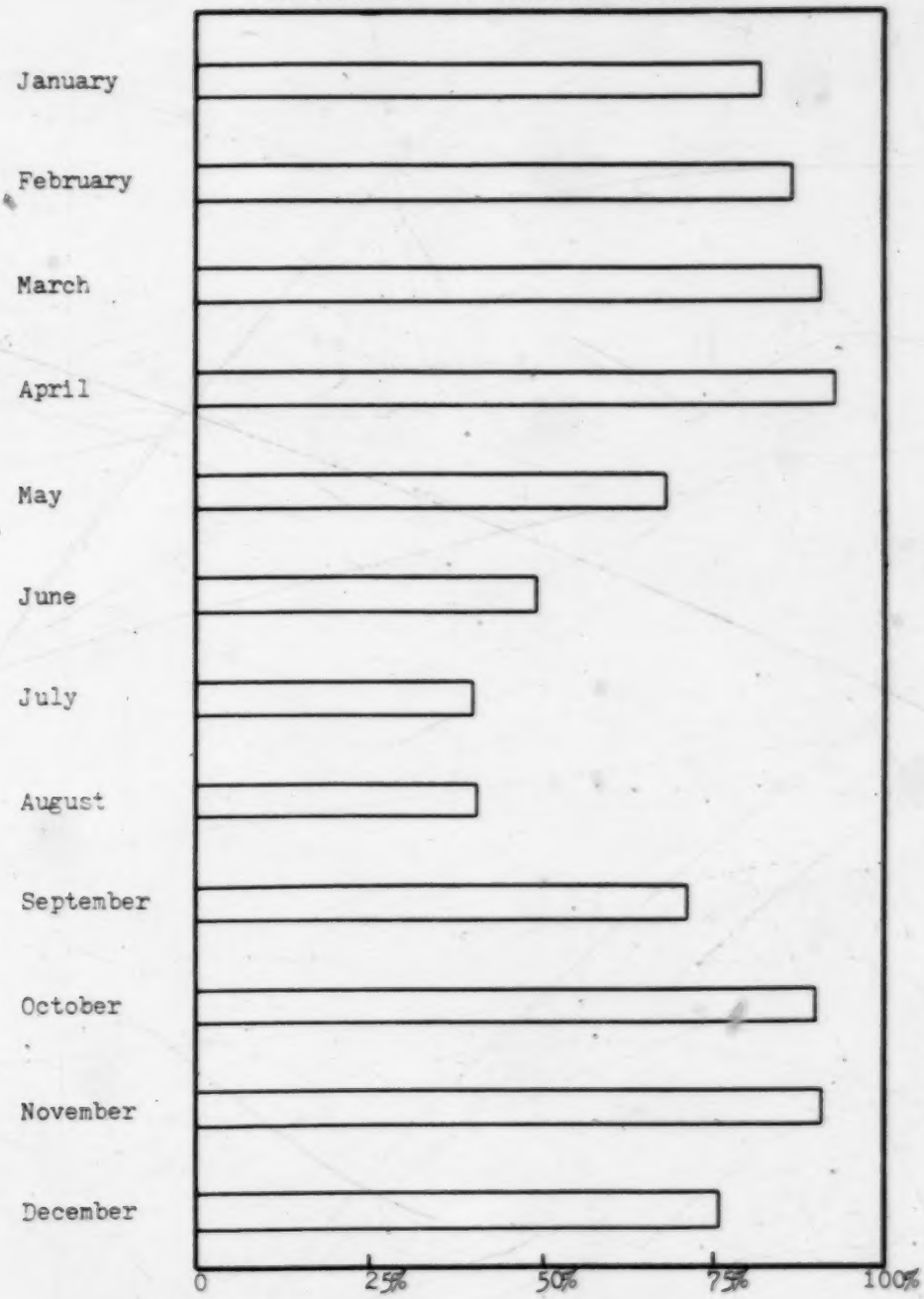
TABLE 4

CONVENIENCE OF MONTHS FOR HORTICULTURE STUDENTS
(N=109)

Month	N	% oF Total Response
January	92	84
February	104	96
March	99	91
April	102	94
May	75	69
June	54	50
July	45	41
August	45	41
September	79	72
October	99	91
November	101	92
December	84	77

FIGURE 3

PERCENT OF STUDENTS WHO
FOUND SPECIFIC MONTHS
CONVENIENT TO ATTEND COURSES



An analysis of student preferences for instructional mode and scheduling will be found in Table 5. A grading scale with the values (x=1) not preferred format to (x=5) strongly preferred format was computed for the results. The preferred instructional format was found to be "once a week" with a mean preferrence rating of 3.53.

TABLE 5

STUDENT PREFERENCES FOR
INSTRUCTIONAL MODES AND SCHEDULING

Instructional Format	N	Mean	Grading Scale
Evening sessions/ once a week	107	3.53	Strongly preferred ($\bar{X}$=5)
Saturday/3 hours	108	2.97	↑
All day Saturday	106	2.54	
Educational T.V.	106	2.49	
Evenings Twice a week	106	2.45	
Correspondence/ Independent Study	107	2.40	
Sunday/3 hours	106	2.17	Not preferred ($\bar{X}$=1)
Educational Radio	105	1.93	

*Analysis of Variance revealed an F Ratio of 12.82, p<0.000

As Table 6 indicates, a Scheffe Post Hoc Comparisons procedure with the various instructional formats, has found the only desirable alternative to "evenings once a week" is a 3-hour Saturday format.

TABLE 6

COMPARISON OF PREFERENCES BETWEEN PAIRS OF INSTRUCTIONAL FORMATS

INSTRUCTIONAL FORMAT	Educational Radio	Sunday/3 hours	Correspondence/ Independent Study	Evenings/twice a week	Educational T.V.	All day Saturday	Saturday 3 hours	Evenings once a week
Educational Radio								
Sunday/3 hours								
Correspondence/ Independent Study								
Evenings/twice a week								
Educational T.V.								
All day Saturday								
Saturday 3 hours	*	*						
Evenings once a week	*	*	*	*	*	*		

*denotes significantly different Scheffe Post Hoc comparisons existing between the pairs of techniques at a $p<0.100$ level

Table 7 rreports on students' opinions on how frequently teaching techniques should be used in the program. A grading scale, with the values (x=1) "never use the teaching method" to (x=5) "use the teaching techniques often," was computed for the results.

Table 7

STUDENT PREFERENCES FOR
SPECIFIC TEACHING TECHNIQUES

TEACHING TECHNIQUE	FREQUENCY	MEAN	GRADING SCALE
Lecture	102	4.13	Used often ($\bar{x}$=5)
Reference Materials	104	4.10	
Examples of Specimens, etc.	103	4.05	
Slides/Films	104	3.99	
Demonstrations in Class	103	3.77	
Laboratory	96	3.47	
Field Trips	103	3.24	Never Used ($\bar{x}$=1)
Class Discussions	102	3.22	

*Analysis of variance revealed an F Ratio of 17.29, Fprob.=0.00

Upon further comparison of the teaching techniques with a Scheffe Post Hoc comparisons test, a definite division between groups are apparent in Table 8. Techniques such as slides/films, examples of specimens, etc., reference materials and lectures received a "use often" rating. In contrast, the second group, demonstrations in class, laboratory, field trips and class discussions fell between "use often" and "use sometimes". Since all the teaching techniques were given at least a "use sometimes" rating, students appear to have a favourable attitude towards all these teaching techniques.

Free responses asking for suggestions produced results set forth in Table 9

TABLE 8

COMPARISON OF PREFERENCES BETWEEN PAIRS OF TEACHING TECHNIQUES

TEACHING TECHNIQUES	Class discussions	Field Trips	Laboratory	Demonstrations in class	Slides/film	Eg. of Specimens	Reference Materials	Lectures
Class discussions								
Field Trips								
Laboratory								
Demonstrations in class	•	•						
Slides/film	•	•	•					
Eg. of Specimens	•	•	•					
Reference Materials	•	•	•					
Lectures	•	•	•					

•denotes significantly different Scheffe Post Hoc comparisons existing between the pairs of techniques at a $p<0.100$ level.

TABLE 9

RESPONDENTS' SUGGESTIONS FOR FUTURE HORTICULTURAL TOPICS AND COURSES

1. Advanced course on indoor gardening
2. Arboriculture
3. Beekeeping
4. Effects of simplification as an aid in the production of unusual tropical plants, perennials and annuals
5. Fertilizers and chemicals used in horticulture
6. Grass seeds and growing plants from seeds
7. Gardening tips for small lots and lawns
8. How to develop an Outdoor Green Thumb
9. Horticulture for acreage versus city dwellers
10. Identification of plants which are easy to grow in Alberta and their specific growth needs
11. Industrial plant production
12. Information on small commercial gardening operations
13. Legumes
14. Operating and earning profit in the greenhouse business
15. Ornamental plants
16. Pest control
17. Plant propagation, pruning and grafting, growing fruit trees
18. Soils in horticulture
19. Solar storage units and other equipment
20. Tropical botany and plant diseases

21. Turf diseases and dutch elm disease.
22. Vegetables and perennials in the home garden
23. Weed control

4.3 EVALUATION RESULTS FOR THE COURSE, "BEGINNING GARDENING AND LANDSCAPING"

Students indicated time-scheduling and "other" as being major discouragers of full participation, as will be seen in Table 10.

TABLE 10

STUDENTS' REASONS FOR MISSING CLASSES

Reason	N	% of Responses
Course location	3	12%
Time scheduling	9	35%
Subject content	2	8%
Teaching techniques	2	8%
Other	10	38%
Total Responses	26	100%

Table 11 shows that the majority of students (83%) indicated the course material was correctly described by the promotional material. The "Beginning Gardening and Landscaping" course is highly recommended (90%) for the beginning gardener. Half of the students recommend this course for experienced gardeners.

TABLE 11

OPINIONS ON PROMOTIONAL STRATEGIES

Statement	N	% of Responses % Agree	% Disagree
The course material was what I expected when I enrolled in the course.	29	24(83%)	5(17%)
I would recommend this course to a beginning gardener.	29	26(90%)	3(10%)
I would recommend this course to an experienced gardener.	29	14(48%)	15(52%)

A favourable attitude towards the classroom climate and instructor's presentation style will be seen in Table 12.

Table 12

OPINIONS ON THE TEACHING TECHNIQUES USED IN THE COURSE: "BEGINNING GARDENING AND LANDSCAPING

Statement	N	% Of Responses % Agree	% Disagree
Students were encouraged to share their horticultural experiences with the class.	26	18(69%)	8(31%)
The instructor's presentation was easy to follow.	27	22(81%)	5(19%)
There was enough class participation.	29	18(62%)	11(38%)
Attending class was a relaxing experience.	28	26(93%)	2(7%)

Specific strengths in the teaching methods used in the course, are summarized in Table 13.

TABLE 13

STRENGTHS OF THE TEACHING TECHNIQUES USED IN THE COURSE (Interview data N=4)

1. Reference materials were adequate.
2. Quality of the lectures.
3. Length of course and time scheduling.
4. Reference material was good.
5. Liked variety of speakers.

In Table 14, the detailed analysis of student opinions on the teaching techniques used in the course shows an inadequate use of field trips and class demonstrations.

TABLE 14

ASSESSMENTS OF THE TEACHING TECHNIQUES USED IN THE COURSE

Teaching Technique	N	Not Used	Too Little	Just Right	Too Often
Class discussions	25	4(14%)	8(30%)	15(56%)	
Examples of Specimens, etc.	29	1(3%)	7(24%)	21(72%)	
Slides/films	29		3(10%)	22(76%)	4(14%)
Laboratory	29	18(62%)	4(14%)	6(21%)	1(3%)
Reference materials	29		8(28%)	21(73%)	
Lecture	29		3(10%)	26(90%)	
Field trips	28	6(21%)	14(50%)	7(25%)	1(4%)
Demonstrations in class	28	10(36%)	13(46%)	5(18%)	

COURSE TIME ALLOCATION (N=27)

In connection with the appropriateness of course time allocated for covering content, 9(33%) of the students indicated not enough time was allocated and 16(59%) found it adequate.

As shown in Table 15, all responses were favourable towards using the University as the course location.

TABLE 15

STUDENT ATTITUDES TOWARDS COURSE LOCATION

Statement	N	% Of Responses % Agree	% Disagree
The classroom was in a convenient location.	29	29(100%)	
Coming to the University was not a threatening experience.	29	29(100%)	

From the analysis of student motives for enrolling in the course in Table 16, it is apparent that there are significant differences in the amount of influence different motives have for encouraging participation. A grading scale, using the values ($\bar{x}$=1) "did not influence decision to enrol in the course" to ($\bar{x}$=5) "strongly influenced decision to enrol in the course" was computed for the results. The students' strongest motive for

enrolling in the "Beginning Gardening and Landscaping" course was to "improve gardening skills" followed by "subject sounded interesting". Motives which had some influence was to "solve a specific problem." and "save money on gardening supplies and services".

TABLE 16

MOTIVES FOR ENROLLING IN THE COURSE "BEGINNING GARDENING AND LANDSCAPING"

Motive	N	Mean	Grading Scale For Strength of Influence
Improve gardening skills	30	4.84	Strong Influence ($\bar{x}$=5)
Subject sounded interesting	31	4.20	
To solve a specific problem	29	3.65	
Save money on gardening supplies and services	30	3.10	
Share ideas with other people	31	2.35	
Keep current in my field	31	2.24	
Get away from daily routine	29	2.17	
Meet new people	29	1.55	No Influence ($\bar{x}$=1)

*Analysis of Variance reveals an F Ratio of 28.77, p<0.000

A further comparison of student motives follows in Table 17, where a Scheffe Post Hoc Comparisons procedure shows that the more practical, less-social motives are more influential than social reasons for encouraging participation.

TABLE 17

COMPARISON OF INFLUENCE BETWEEN PAIRS OF MOTIVES

MOTIVE	Meet new people	Get away from daily routine	Keep current in my field	Share ideas with other people	Save money on gardening supplies and services	To solve a specific problem	Subject sounded interesting	Improve gardening skills
Meet new people								
Get away from daily routine								
Keep current in my field								
Share ideas with other people								
Save money on gardening supplies and services	*							
To solve a specific problem	*	*	*	*				
Subject sounded interesting	*	*	*	*	*			
Improve gardening skills	*	*	*	*	*	*		

*denotes significantly different Scheffe Post Hoc Comparisons existing between the pairs of motives at a $p<0.100$ level.

The interview results in Table 18 reinforce the questionnaire data which reveals the students' goal-orientation towards enrolling in this course.

Table 18

SUMMARY OF REASONS FOR ENROLLING IN THE COURSE
(Interview Data N=4)

1. Information gathering for work purposes
   -grafting/pruning.
2. Specific problem on outdoor home landscaping.
3. Specific information on trees and shrubs.
4. Problems had in mind.

Students' opinions on the practical and technical nature of the subject content are shown in Table 19.

Table 19

ATTITUDES TOWARDS COURSE CONTENT

Statement	N	% Of Responses % Agree	% Disagree
The course material was not too technical.	29	25(86%)	4(14%)
The course provided me with practical information.	29	28(97%)	1(3%)

The detailed analysis in the questionnaire on topic "content newness and practicality" shown in Table 20 reveals that the mean of the responses concerning newness was 3.59 on a five-point scale. Concerning practicality of the course information, it will be noted that the mean of the responses was 3.13.

TABLE 20

NEWNESS AND PRACTICALITY OF COURSE CONTENT

Criterion	N	Mean	Grading Scale	
NEWNESS	31	3.59	Very New Material ($\bar{X}$=5) ←	Not New Material ($\bar{X}$=1)
PRACTICALITY	29	3.13	Refer Often to Course Material ($\bar{X}$=5) ←	Never Refer to Course Material ($\bar{X}$=1)

Students' opinions on how useful the course content was, are summarized in Table 21.

TABLE 21

USEFULNESS OF COURSE CONTENT
(Interview data N=4)

1. Not practical enough, found too much emphasis on flowers.
2. Did not solve landscaping questions.
3. Not specific enough to Edmonton Horticultural conditions.
4. Not very useful.

MEETING STUDENTS' OBJECTIVES

In connection with this course, 23 respondents (77%) stated that their objectives were met, while 7(23%) reported that their objectives were not met.

As will be seen in Table 22, seven out of the thirty-one students were dissatisfied with the course because it did not provide them with enough information to satisfactorily meet their gardening needs.

Table 22

EXPLANATIONS OF WHY STUDENTS' OBJECTIVES WERE NOT MET BY THE COURSE

1. Wanted more on ornamental aspects of horticulture.
2. Did not improve gardening skills because the course was too general and broad
3. Did not provide simple enough information for the beginner, too technical, wanted a more "how-to-do" it course.
4. Did not provide information for keeping current in the field and improving gardening skills
5. Not enough information on houseplants, lecturer in garden plant diseases and control hard to understand.
6. Required more time spent on berry farming, fruit trees and companion planting.
7. Course was too short, covered too broad a field in horticulture.

Areas students found weak in the course are summarized in Table 23.

Table 23

AREAS STUDENTS FOUND WEAK IN THE COURSE
(Interview data N=4)

1. Too theoretical, not practical enough
2. Too rushed, overly concerned with predetermined course outline.
3. Instructor's verbal presentation was difficult to follow.
4. No coffee breaks, not enough class participation.

DISCUSSION

The evaluation results for the course "Beginning Gardening and Landscaping" provide useful insights into the strengths and weaknesses of the course. There were several strengths in the course, such as an accurate description of the course content in the advertising material, and a convenient course location. The only major weakness found in the course was an insufficient use of field trips and class demonstraations. An area which did not receive a negative response, but could be improved is the practical nature of the course content, since students only rated subject content practcality 3.13 on a five-point scale.

4.3 EVALUATION RESULTS FOR THE COURSE, "CONTROL OF HOME AND GARDEN INSECT PESTS"

Students indicated time-scheduling as being the major barrier, with subject content, teaching techniques and other as minor barriers to participation, as will be shown in Table 24.

TABLE 24

STUDENTS' REASONS FOR MISSING CLASSES

Reason	N	% of Responses
Course location	0	0%
Time scheduling	4	50%
Subject content	2	25%
Teaching techniques	1	12%
Other	1	13%
Total Responses	8	100%

Table 25 shows that the majority of students (65%) indicated that the course material was correctly described by the promotional material. The "Control of Home and Garden Insect Pests" course was highly recommended for beginning (93%) and experienced (80%) gardeners.

Table 25

OPINIONS ON PROMOTIONAL STRATEGIES

Statement	N	% of Responses % Agree	% Disagree
The course material was what I expected when I enrolled in the course.	17	11(65%)	6(35%)
I would recommend this course to a beginning gardener.	15	14(93%)	1(7%)
I would recommend this course to an experienced gardener.	15	12(80%)	3(20%)

STRENGTHS OF THE TEACHING TECHNIQUES USED IN THE COURSE
(Interview data N=2)

Specific strengths in the teaching techniques used in the course are identified by the students as (1) slides were good, and instructor was knowledgeable on the identification of insects, and (2) well organized; commentation with slides was good.

A favourable attitude towards the classroom climate and instructor's presentation style will be seen in Table 26.

Table 26

OPINIONS ON THE TEACHING TECHNIQUES USED IN THE COURSE "CONTROL OF HOME AND GARDEN INSECT PESTS"

Statement	N	% of Responses % Agree	% Disagree
Students were encouraged to share their horticultural experiences with the class.	16	11(56%)	5(31%)
The instructor's presentation was easy to follow.	17	13(76%)	4(24%)
There was enough class participation.	15	9(60%)	6(40%)
Attending class was a relaxing experience.	16	15(94%)	1(6%)

COURSE TIME ALLOCATION (N=16)

In connection with the appropriateness of course time allocatd for covering content, 7(44%) of the students indicated not enough time was allocated and 9(56%) found it adequate.

In Table 27, students opinions were favourable towards the teaching techniques used in the course.

TABLE 27

ASSESSMENT OF THE TEACHING TECHNIQUES USED IN THE COURSE

Teaching Technique	N	Not Used	Too Little	Just Right	Too Often
Class discussions	16		4(25%)	7(69%)	1(6%)
Examples of Specimens, etc.	16		7(44%)	8(50%)	1(6%)
Slides/films	16		9(6%)	14(88%)	1(6%)
Laboratory	16	11(79%)	2(14%)	1(7%)	
Reference materials	14	1(6%)	5(31%)	10(63%)	
Lecture	17		4(25%)	12(75%)	1(6%)
Field trips	14	12(86%)		2(14%)	
Demonstrations in class	13	8(62%)	2(15%)	3(23%)	

As shown in Table 28, all responses were favourable towards using the University as the course location.

TABLE 28

ATTITUDES TOWARDS COURSE LOCATION

Statement	N	% of Responses	
		% Agree	% Disagree
The classroom was in a convenient location.	17	15(88%)	2(12%)
Coming to the University was not a threatening experience.	17	15(88%)	2(12%)

From the analysis of student motives for enrolling in the course in Table 29, it is apparent that there are significant differences in the amount of influence different motives have for encouraging participation. A grading scale using the values (x=1) did not influence decision to enrol in the course to (x=5) strongly influenced decision to enrol in the course, was computed for the results. The students' strongest motive for enrolling in the "Control of Home and Garden Insect Pests" course was to "improve gardening skills" followed by "subject sounded interesting" and to "solve a specific problem".

TABLE 29

MOTIVES FOR ENROLLING IN THE COURSE:
"CONTROL OF HOME AND GARDEN INSECT PESTS"

Motive	N	Mean	Grading Scale For Strength of Influence
Improve gardening skills	17	4.24	Strong Influence ($\bar{X}$=5)
Subject sounded interesting	17	3.94	
To solve a specific problem	17	3.41	
Keep current in my field.	16	2.88	
Share ideas with other people	16	1.88	
Get away from daily routine	16	1.69	
Save money on gardening supplies and services	16	1.63	
Meet new people	16	1.56	No Influence ($\bar{X}$=1)

*Analysis of Variance reveals an F Ratio of 15.50, p<0.000

A further comparison of student motives follows in Table 30, where a Scheffe Post Hoc Comparisons procedure, shows that the more practical, less-social motives are more influential than social reasons for encouraging participation.

TABLE 30

COMPARISON OF INFLUENCE BETWEEN PAIRS OF MOTIVES

MOTIVE	Meet new people	Save money on gardening supplies and services	Get away from daily routine	Share ideas with other people	Keep current in my field	To solve a specific problem	Subject sounded interesting	Improve gardening skills
Meet new people								
Save money on gardening supplies and services								
Get away from daily routine								
Share ideas with other people								
Keep current in my field								
To solve a specific problem	*	*	*	*				
Subject sounded interesting	*	*	*	*				
Improve gardening skills	*	*	*	*				

*denotes significantly different Scheffe Post Hoc comparisons existing between the pairs of motives at a $p<0.100$ level.

REASONS FOR COURSE ENROLLMENT
(Interview data N=2)

Students were strongly influenced to enroll in the course because of problems with household pests and the need for specific information on chemicals for controlling pests.

Students opinions on the practical and technical nature of the subject content will be shown in Table 31.

Table 31

ATTITUDES TOWARDS COURSE CONTENT

Statement	N	% of Responses % Agree	% Disagree
The course material was not too technical.	17	13(76%)	4(24%)
The course provided me with practical information.	16	14(88%)	2(13%)

The detailed analysis in the questionnaire on subject content newness and practicality shown in Table 32 reveals that the mean of the responses concerning newness was 3.24 on a five-point scale. Concerning practicality of the course information, it will be noted that the mean of the responses was 2.96.

TABLE 32

NEWNESS AND PRACTICALITY OF COURSE CONTENT

Criterion		Mean	Grading Scale	
NEWNESS	17	3.24	Very New Material ($\bar{X}$=5) ←	Not New Material ($\bar{X}$=1)
PRACTIC-ALITY	17	2.96	Refer Often to Course Material ($\bar{X}$=5) ←	Never Refer to Course Material ($\bar{X}$=1)

USEFULNESS OF COURSE CONTENT
(Interview data N=2)

Students' opinions on how useful the course content were: (1) some of the information was useful, and (2) there was not enough information on chemicals for pest control.

MEETING STUDENTS' OBJECTIVES

In connection with this course, 14(78%) respondents stated that their objectives were met, while 4(22%) reported that their objectives were not met.

As will be seen in Table 33, seven out of the eighteen students were dissatisfied with the course because it did not provide them with enough information to satisfactorily meet their gardening needs.

Table 33

EXPLANATIONS OF WHY STUDENT'S OBJECTIVES WERE NOT MET BY THE COURSE

1. Attendance
2. Too much on house pests, not enough on garden and indoor plant pests.
3. Too broad, expected a course on controlling insects that could attack house plants.
4. Not enough related to horticulture.
5. Need more handout material to refer to on problems as they arise.
6. Could have been in more depth.
7. Required more practical knowledge of control methods - what to do.

WEAKNESSES IN THE COURSE
(Interview data N=2)

Weak areas identified from the student interviews were: (1) the need for a longer course with a review at the end of the course to ensure adequate coverage of student problems with pests, and (2) more information on kinds of chemicals for controlling insects.

DISCUSSION

The evaluation results for the course "Control of Home and Garden Insect Pests" have identified the strong and weak aspects of the course. The strengths in the course were a well-executed slide presentation, an accurate description of the course content in the advertising

material, appropriate choice of teaching techniques, and a convenient course location. Time-scheduling was a barrier to participation for 50% of the students. Course information usability could be improved to more closely focus on students' immediate pest problems.

4.3 EVALUATION RESULTS FOR THE COURSE, "GREENHOUSE DESIGN, CONSTRUCTION AND MANAGEMENT I"

As will be seen in Table 34, students identified time-scheduling, subject content, and teaching techniques as being barriers to participation.

Table 35 shows that the majority of students (65%) indicated that the course material was correctly described by the promotional material. The "Greenhouse Design, Construction and Management I" course is recommended for beginning(57%) and experienced gardeners(71%).

TABLE 34

STUDENTS REASONS
FOR MISSING CLASSES

Reason	N	% of Responses
Course location	2	11%
Time scheduling	4	22%
Subject content	6	33%
Teaching techniques	5	28%
Other	1	6%
Total Responses	18	100%

Table 35

OPINIONS ON PROMOTIONAL STRATEGIES

Statement	N	% Of Responses % Agree	% Disagree
The course material was what I expected when I enrolled in the course.	20	12(60%)	8(40%)
I would recommend this course to a beginning gardener.	23	13(57%)	10(43%)
I would recommend this course to an experienced gardener.	21	15(71%)	6(29%)

A favourable attitude towards the classroom climate and instructor's presentation style will be seen in Table 36.

TABLE 36

OPINIONS ON THE TEACHING TECHNIQUES USED IN THE COURSE "GREENHOUSE DESIGN, CONSTRUCTION AND MANAGEMENT I"

Statement	N	% Of Responses	
		% Agree	% Disagree
Students were encouraged to share their horticultural experiences with the class.	22	11(50%)	11(50%)
The instructor's presentation was easy to follow.	23	16(70%)	7(10%)
There was enough class participation.	23	14(61%)	9(39%)
Attending class was a relaxing experience.	22	18(82%)	4(18%)

Teaching technique strengths identified by the students are in Table 37.

TABLE 37

STRENGTHS OF THE TEACHING TECHNIQUES USED IN THE COURSE (Interview data N=4)

1. The lighting information was useful.
2. Responsive to class.
3. Found the greenhouse tour interesting.
4. Good slides.

In Table 38, the detailed analysis of student opinions on the teaching techniques used in the course shows half of the students found an inadequate use of field trips.

TABLE 38

ASSESSMENT ON THE TEACHING TECHNIQUES USED IN THE COURSE.

Teaching Technique	N	Not Used	Too Little	Just Right	Too Often
Class discussions	23	4(17%)	4(17%)	15(65%)	
Examples of Specimens, etc.	21	3(14%)	6(29%)	12(57%)	
Slides/films	21		3(14%)	18(86%)	
Laboratory	20	11(55%)	8(55%)	1(5%)	
Reference materials	21		7(33%)	14(67%)	
Lecture	23			17(74%)	6(26%)
Field trips	22	1(5%)	11(50%)	10(45%)	
Demonstrations in class	21	3(14%)	5(24%)	13(62%)	

COURSE TIME ALLOCATION
(Interview data N=21)

In connection with the appropriateness of course time allocated for covering content, 3(14%) of the students indicated not enough time was allocated, 12(57%) found it adequate, and 6(29%) thought too much time was spent on the subject matter.

As shown in Table 39, all responses were favourable towards using the University as the course location.

TABLE 39

ATTITUDES TOWARDS COURSE LOCATION

Statement	N	% of Responses % Agree	% Disagree
The classroom was in a convenient location.	22	19(86%)	3(14%)
Coming to the University was not a threatening experience.	22	21(95%)	1(5%)

From the analysis of student motives for enrolling in the course in Table 40, it is clear that there are significant differences in the amount of influence different motives have for encouraging participation. A grading scale, using the values ($\bar{x}$=1) "did not influence decision to enrol in the course" to ($\bar{x}$=5) "strongly influenced decision to enrol in the course," was computed for the results. The students' strongest motive for enrolling in the "Control of Home and Garden Insect Pests" course was "to improve gardening skills" followed by "subject sounded interesting". A motive which had some influence was to "solve a specific problem".

Table 40

MOTIVES FOR ENROLLING IN THE COURSE
"GREENHOUSE DESIGN, CONSTRUCTION AND MANAGEMENT I"

Motive	N	Mean	Grading Scale For Strength of Influence
Improve gardening skills	24	4.29	Strong Influence ($\bar{X}$=5)
Subject sounded interesting	23	3.96	
To solve a specific problem	23	3.30	
Share ideas with other people.	24	2.29	
Keep current in my field	21	2.00	
Save money on gardening supplies and services	23	1.96	
Get away from daily routine	23	1.91	
Meet new people	24	1.79	No Influence ($\bar{X}$=1)

*Analysis of Variance reveals an F Ratio of 14.21, $p>0.000$

A further comparison of student motives follows in Table 41, where a Scheffe Post Hoc Comparisons procedure, shows that the more practical, less-social motives are more influential than social reasons for encouraging participation.

TABLE 41

COMPARISON OF INFLUENCE BETWEEN PAIRS OF MOTIVES

MOTIVE	Meet new people	Get away from daily routine	Save money on gardening supplies and services	Keep current in my field	Share ideas with other people.	To solve a specific problem	Subject sounded interesting	Improve gardening skills
Meet new people								
Get away from daily routine								
Save money on gardening supplies and services								
Keep current in my field								
Share ideas with other people.								
To solve a specific problem	*	*	*					
Subject sounded interesting	*	*	*	*	*			
Improve gardening skills	*	*	*	*	*			

*denotes significantly different Scheffe Post Hoc comparisonsexisting between the pairs of motives at a $p<0.100$ level.

The interview results in Table 42 summarizes students reasons for enrolling in the course.

Table 42

SUMMARY OF REASONS FOR ENROLLING IN THE COURSE (Interview data N=3)

1. Personal knowledge.
2. Information to enable them to complete a specific project.
3. General information on greenhouses.

Students opinions on the practical and technical nature of the subject content are shown in Table 43.

Table 43

ATTITUDES TOWARDS COURSE CONTENT

Statement	N	% Of Responses	
		% Agree	% Disagree
The course material was not too technical.	22	18(82%)	4(18%)
The course provided me with practical information.	23	17(74%)	6(26%)

The detailed analysis in the questionnaire on subject content newness and practicality shown in Table 44 reveals that the mean of the responses concerning newness was 3.80 on a five point scale. Concerning practicality of the course information, it will be noted that the mean of the responses was 2.27.

TABLE 44

NEWNESS AND PRACTICALITY OF COURSE CONTENT

Criterion	N	Mean	Grading Scale	
NEWNESS	24	3.80	Very New Material ($\bar{X}$=5) ←	Not New Material ($\bar{X}$=1)
PRACTICALITY	22	2.27	Refer Often to Course Material ($\bar{X}$=5) ←	Never Refer to Course Material ($\bar{X}$=1)

USEFULNESS OF COURSE CONTENT
(Interview data N=4)

Students' opinions on how useful the course content were (1) found a small amount of the information useful (two students gave this response) and (2)some of the information was useful(two students gave this response)

MEETING STUDENTS' OBJECTIVES

In connection with this course, 13(57%) respondents stated that their objectives were met, while 10(44%) reported that their objectives were not met.

As will be seen in Table 45, nine out of the twenty three students were dissatisfied with the course because of time-scheduling and insufficient practical information.

Table 45

EXPLANATIONS OF WHY STUDENT OBJECTIVES WERE NOT MET BY THE COURSE

1. Subject matter was too concerned with theoretical planning of large scale commercial operations. It was expected, that the course would be specific to small home hobby greenhouses as it is unlikely that the number of attendees would be commercially oriented.
2. Would have liked written material to support lectures.
3. Course did not provide sufficient practical information.
4. The instructor did not deal with the practicalities of the construction and care of greenhouses to any depth of satisfaction whatsoever.
6. I thought it would deal with operating greenhouses, but too much detail on technical building requirements.
7. Only partly met my objectives. Would have liked parts I and II all at once.
8. Did not attend all the sessions-Saturday morning was a very poor choice of time for my situation.
9. I missed a couple of Saturday morning courses because of travel. Also, a 9a.m. start is too early for someone who has to drive 30 miles-suggest 10a.m. to 1 p.m.

WEAKNESSES IN THE COURSE
(Interview data N=1)

A major weakness in the course was that it was not appropriate for the home handyman of modest means.

DISCUSSION:

The data collected for the course "Greenhouse Design, Construction and Management I" has shown the University to be a very convenient course location for the students. A weak area in the course is the focus of the course content. Although students indicated much of the information was new, they referred to it infrequently. In both questionnaire and interview data, students indicated a dissatisfaction with the course because it did not provide them with adequate information on how to build inexpensive, "hobby type" greenhouses.

4.3 EVALUATION RESULTS FOR THE COURSE "GREENHOUSE DESIGN, CONSTRUCTION AND MANAGEMENT II"

Students indicated time-scheduling, course location, and other as being major barriers to participation, as will be seen in Table 46.

Table 47 shows that the majority of students (85%) indicated that the course material was correctly described by the promotional material. The "Greenhouse Design, Construction and Management II" course is highly recommended for beginning (83%) and experienced (100%) gardeners.

TABLE 46

STUDENTS' REASONS FOR MISSING CLASSES

Reason	N	% of Responses
Course location	1	20%
Time scheduling	2	40%
Subject content	0	0%
Teaching techniques	0	0%
Other	2	40%
Total Responses	4	100%

TABLE 47

OPINIONS ON PROMOTIONAL STRATEGIES

Statement	N	% of Responses	
		% Agree	% Disagree
The course material was what I expected when I enrolled in the course.	13	11(85%)	2(15%)
I would recommend this course to a beginning gardener.	12	10(83%)	2(17%)
I would recommend this course to an experienced gardener.	11	11(100%)	

A favourable attitude towards the classrom climate and instructor's presentation style will be seen in Table 48.

TABLE 48

OPINIONS ON THE TEACHING TECHNIQUES USED IN THE COURSE "GREENHOUSE DESIGN, CONSTRUCTION AND MANAGEMENT II"

Statement	N	% of Responses % Agree	% Disagree
Students were encouraged to share their horticultural experiences with the class.	11	7(64%)	4(36%)
The instructor's presentation was easy to follow.	13	13(100%)	
There was enough class participation.	12	11(92%)	1(8%)
Attending class was a relaxing experience.	13	13(100%)	1(6%)

STRENGTHS OF THE TEACHING TECHNIQUES USED IN THE COURSE
(Interview Data N=1)

A specific strength of the course was the general topic outline.

In Table 49, the detailed analysis of student opinions on the teaching techniques shows an inadequate use of laboratories. Although laboratories were not used in the course, 7 respondents implied they would like it included, because of their responses under "Just Right".

Table 49

ASSESSMENT OF THE TEACHING TECHNIQUES USED IN THE COURSE

Teaching Technique	N	Not Used	Too Little	Just Right	Too Often
Class discussions	12	2(17%)	1(8%)	9(75%)	
Examples of Specimens, etc.	13		1(8%)	12(92%)	
Slides/films	13		5(38%)	8(62%)	
Laboratory	12	3(25%)	7(58%)	2(17%)	
Reference materials	12		4(33%)	8(67%)	
Lecture	13		1(8%)	11(84%)	1(8%)
Field trips	12		5(42%)	7(58%)	
Demonstrations in class	13	1(8%)	4(31%)	8(62%)	

COURSE TIME ALLOCATION (N=10)

In connection with the appropriateness of course time allocated for covering content, 4(40%) of the students indicated not enough time was allocated, 4(40%) found it adequate, and 2(20%) thought too much time was spent on the subject matter.

As shown in Table 50, all responses were favourable towards using the University as the course location.

TABLE 50

ATTITUDES TOWARDS COURSE LOCATION

Statement	N	% of Responses % Agree	% Disagree
The classroom was in a convenient location.	13	13(100%)	
Coming to the University was not a threatening experience.	13	12(92%)	1(08%)

From the analysis of student motives for enrolling in the course in Table 51, it is apparent that there are significant differences in the amount of influence different motives have for encouraging participation. A grading scale using the values ($\bar{x}$=1) "did not influence decision to enrol in the course" to ($\bar{x}$=5) "strongly influenced decision to enrol in the course," was computed for the results. The students' strongest motive for enrolling in the "Control of Home and Garden Insect Pests" course was "subject sounded interesting" followed by "improve gardening skills". Motives which had some influence were to "keep current in [their] fields", and "solving a specific problem".

Table 51

MOTIVES FOR ENROLLING IN THE COURSE "GREENHOUSE DESIGN, CONSTRUCTION AND MANAGEMENT II"

Motive	N	Mean	Grading Scale For Strength of Influence
Subject sounded interesting	13	4.23	Strong Influence ($\bar{x}$=5)
Improve gardening skills	13	4.00	
Keep current in my field	12	3.33	
To solve a specific problem	13	3.00	
Share ideas with other people	13	2.15	
Get away from daily routine	13	1.92	
Meet new people	13	1.85	
Save money on gardening supplies and services	13	1.31	No Influence ($\bar{x}$=1)

*Analysis of Variance reveals an F Ratio of 6.58, $p<0.000$

A further comparison of student motives follows in Table 52, where a Scheffe Post Hoc Comparisons procedure, shows that the students were interested in obtaining information which they could apply immediately to their greenhouse problems.

TABLE 52

COMPARISON OF INFLUENCE BETWEEN PAIRS OF MOTIVES

MOTIVE	Save money on gardening supplies and services	Meet new people	Get away from daily routine	Share ideas with other people	To solve a specific problem	Keep current in my field	Improve gardening skills	Subject sounded interesting
Save money on gardening supplies and services								
Meet new people								
Get away from daily routine								
Share ideas with other people								
To solve a specific problem								
Keep current in my field								
Improve gardening skills	*	*						
Subject sounded interesting	*	*	*					

*denotes significantly different Scheffe Post Hoc comparisons existing between the pairs of motives at a $p<0.100$ level.

REASON FOR COURSE ENROLLMENT
(Interview data N=1)

The student was searching for information to solve a problem dealing with greenhouse management.

Students' opinions on the practical and technical nature of the subject content are shown in Table 53.

TABLE 53

ATTITUDES TOWARDS COURSE CONTENT

Statement	N	% of Responses	
		% Agree	% Disagree
The course material was not too technical.	13	13(100%)	
The course provided me with practical information.	13	13(100%)	

The detailed analysis in the questionnaire on topic "content newness and practicality" shown in Table 54 reveals that the mean of the responses concerning newness was 3.36 on a five-point scale. Concerning practicality of the course information, it will be noted that the mean of the responses was 3.18.

TABLE 54

NEWNESS AND PRACTICAPLITY OF COURSE CONTENT

Criterion	N	Mean	Grading Scale	
NEWNESS	13	3.36	Very New Material ($\bar{X}$=5) ←	Not New Material ($\bar{X}$=1)
PRACTIC-ALITY	12	3.18	Refer Often to Course Material ($\bar{X}$=5) ←	Never Refer to Course Material ($\bar{X}$=1)

USEFULNESS OF COURSE CONTENT
(Interview data N=1)

I did not find any of the information useful.

MEETING STUDENTS' OBJECTIVES

In connection with this course, 8(62%) respondents stated that their objectives were met, while 5(38%) reported that their objectives were not met.

As will be seen in Table 55, four out the thirteen students were dissatisfied with the course because it did not provide them with enough information to satisfactorily meet their gardening needs.

TABLE 55

EXPLANATIONS OF WHY STUDENTS' OBJECTIVES WERE NOT MET BY THE COURSE

1. Did not cover specific problem.

2. I was more interested in the practical aspects of the subject.

3. The course was not formal enough i.e. too easy to be carefree.

4. No Economic Evaluation Studies of:
Operation of a Greenhouse; Building of a Greenhouse; How to Profitably compete with imports from U.S. and Mexico of fresh vegetable and leaf plants when given the costs of building an efficient greenhouse in Alberta,
-cost of labour, equipment, fuels, water, & supplies for operations, cost of land & associated development costs;
-assistance programs offered by various goverment agencies to promote the development & operation of greenhouses;
-cost of marketing produce by various methods available to the grower; comparative economic evaluations of the potential for profit when taking into account cost of land & development, equipment, labour, maintenance, fuel, supplies, depreciation for "ideal" modern/efficient Greenhouse structure & size; for marketable chosen products with consideration of variances of prices throughout the year, cost of production, cost of storage, cost of marketing,
-computers & programs available to assist greenhouse operations to: provide climatic control, monitor costs by product & total, project potential of profit at various marketing methods & market prices, develop; develop models for projection of potential productivity & profitability of mixed product planting/marketing; evaluations of the potential for composting.

WEAKNESSES IN THE COURSE
(Interview data N=2)

Weak areas identified in the student interviews were: (1) the need for more reference materials such as detailed course outlines for each session.

DISCUSSION

The evaluation results for the course "Greenhouse Design, Construction and Management II" provide useful insights into the strengths and weaknesses of the course. There were several strengths in the course, such as an accurate description of the course content in the advertising material, and a convenient course location. Weaknesses in the course were inconvenient time-scheduling and insufficient hands-on activities. An area which did not receive a negative response, but could be improved is the practicality and newness of the course content, since students only rated subject content newness 3.36 on a five-point scale, and 3.18 for practicality on a five-point scale.

4.3 EVALUATION RESULTS FOR THE COURSE "HOW TO DEVELOP A GREEN THUMB WITH HOUSEPLANTS"

Students indicated other as being the major barrier to participation, as will be shown in Table 56. The small N makes this finding of limited usefulness.

TABLE 56

STUDENTS' REASONS FOR MISSING CLASSES

Reason	N	% of Responses
Course location	0	0%
Time scheduling	0	0%
Subject content	0	0%
Teaching techniques	0	0%
Other	3	100%
Total Responses	3	100%

Table 57 shows that the majority of students (100%) indicated that the course material was correctly described by the promotional material. The "How To Develop A Green Thumb With Houseplants" course is highly recommended (100%) for beginning gardeners. Students do not recommend this course for experienced gardeners.

Table 57

OPINIONS ON PROMOTIONAL STRATEGIES

Statement	N	% of Responses % Agree	% Disagree
The course material was what I expected when I enrolled in the course.	8	8(100%)	
I would recommend this course to a beginning gardener.	8	8(100%)	
I would recommend this course to an experienced gardener.	8	3(38%)	5(62%)

STRENGTHS OF THE TEACHING TECHNIQUES USED IN THE COURSE
(Interview data N=1)

The student found the demonstrations, diagrans and slides good.

COURSE TIME ALLOCATION

(N=8)

In connection with the appropriateness of course time allocated for covering content, 2(25%) of the students indicated not enough time was allocated and 6(75%) found it adequate.

A favourable attitude towards the classroom climate and instructor's presentation style will be seen in Table 58.

Table 58

OPINIONS ON THE TEACHING TECHNIQUES USED IN THE COURSE "HOW TO DEVELOP A GREEN THUMB WITH HOUSEPLANTS"

Statement	N	% of Responses % Agree	% Disagree
Students were encouraged to share their horticultural experiences with the class.	7	'86'	)
The instructor's presentation was easy to follow.	8	:(10(	
There was enough class participation.	8	7(88%)	1(13%)
Attending class was a relaxing experience.	8	8(100%)	

In Table 59, the detailed analysis of student opinions on the teaching techniques used in the course shows an inadequate use of examples of specimens, etc.

TABLE 59

ASSESSMENT ON THE TEACHING TECHNIQUES USED IN THE COURSE.

Teaching Techniques	N	Not Used	Too Little	Just Right	Too Often
Class discussions	8		2(25%)	6(75%)	
Examples of Specimens, etc.	8		1(12%)	7(88%)	
Slides/films	8		1(13%)	7(88%)	
Laboratory	8		2(25%)	6(75%)	
Reference materials	8			8(100%)	
Lecture	8			7(88%)	1(12%)
Field trips	8	3(38%)	1(12%)	4(50%)	
Demonstrations in class	8		1(13%)	7(87%)	

As shown in Table 60, all responses were favourable towards using the University as the course location.

TABLE 60

STUDENT ATTITUDES TOWARDS COURSE LOCATION

Statement	N	% Of Responses % Agree	% Disagree
The classroom was in a convenient location.	8	8(100%)	
Coming to the University was not a threatening experience.	8	8(100%)	

From the analysis of student motives for enrolling in the course in Table 61, it is apparent that there are significant differences in the amount of influence different motives have for encouraging participation. A grading scale, using the values ($\bar{x}$=1) "did not influence decision to enrol in the course" to ($\bar{x}$=5) "strongly influenced decision to enrol in the course" was computed for the results.. The students' strongest motive for enrolling in the "How To Develop A Green Thumb With Houseplants" course was to "improve gardening skills" followed by "subject sounded interesting". A motive which had some influence was "to solve a specific problem".

Table 61

MOTIVES FOR ENROLLING IN THE COURSE
"HOW TO DEVELOP A GREEN THUMB WITH HOUSEPLANTS"

Motive	N	Mean	Grading Scale For Strength of Influence
Improve gardening skills	9	4.33	Strong Influence (x=5)
Subject sounded interesting	9	4.22	
To solve a specific problem	9	3.00	
Get away from daily routine	9	2.11	
Share ideas with other people	9	1.89	
Save money on gardening supplies and services	9	1.67	
Keep current in my field	9	1.33	
Meet new people	9	1.22	No Influence (x=1)

*Analysis of Variance reveals an F Ratio of 15.50, $p<0.000$

COMPARISON OF INFLUENCE BETWEEN PAIRS OF MOTIVES

The results from the Scheffe Post Hoc comparisons were two homogeneous subsets. One subset comprised these responses: to solve a specific problem, Subject sounded interesting, Improve gardening skill. The second

subset comprised these responses: Meet new people, Keep current in my field, Save money on gardening supplies and services, Share ideas with other people, Get away from daily routine, To solve a specific problem.

REASON FOR COURSE ENROLLMENT

(Interview data N=1)

One reason for enrolling in the course was to learn something new about plants.

Students' opinions on the practical and technical nature of the subject content are shown in Table 62.

Table 62

ATTITUDES TOWARDS COURSE LOCATION

Statement	N	% of Responses % Agree	% Disagree
The course material was not too technical.	8	8(100%)	
The course provided me with practical information.	8	8(100%)	

The detailed analysis in the questionnaire on subject content newness and practicality shown in Table 63 reveals that the mean of the responses concerning newness was 3.42 on a five-point scale. Concerning practicality of the course information, it will be noted that the mean of the responses was 2.98.

TABLE 63

NEWNESS AND PRACTICALITY OF COURSE CONTENT

Criterion	N	Mean	Grading Scale	
NEWNESS	9	3.42	Very New Material ($\bar{X}$=5) ←	Not New Material ($\bar{X}$=1)
PRACTICALITY	8	2.98	Refer Often to Course Material ($\bar{X}$=5) ←	Never Refer to Course Material ($\bar{X}$=1)

USEFULNESS OF COURSE CONTENT
(Interview data N=1)

One student found the information useful.

MEETING STUDENTS' OBJECTIVES
(Interview data N=8)

In connection with this course, 8(87%) respondents stated that their objectives were met, while 1(13%) reported that their objectives were not met.

BARRIERS TO MEETING OBJECTIVES
(N=1)

One student indicated attendance was a major reason for not meeting his/her objectives.

WEAKNESSES IN THE COURSE

(Interview data N=1)

Weak areas identified in the student interview were the lack of specific information for the layman; would have liked more information on day-to-day care of plants; and found too much emphasis on disease control.

DISCUSSION:

The evaluation results for the course "How To Develop A Green Thumb With Houseplants" were positive in all aspects of the course. However, an area which could be strengthened is that of subject content usability since students infrequently used the course information. Therefore, the course's longterm impact could be improved to better meet students desire to "improve their gardening skills".

4.3 EVALUATION RESULTS FOR THE COURSE, "INDOOR LANDSCAPING"

Interview data were not obtainable for this course due to the reluctance of the former students to respond.

Students indicated subject content as being the major barrier, while noting time-scheduling and other as secondary reasons students gave for missing classes, as seen in Table 64.

TABLE 64

STUDENTS' REASONS FOR MISSING CLASSES

Reason	N	% of Responses
Course location	0	0%
Time scheduling	1	25%
Subject content	2	50%
Teaching techniques	0	0%
Other	1	25%
Total Responses	4	100%

Table 65 shows that the majority of students (83%) indicated that the course material was correctly described by the promotional material. The "Indoor Landscaping" course is highly recommended (100%) for beginning gardeners. Students do not recommend this course for experienced gardeners.

TABLE 65

OPINIONS ON PROMOTIONAL STRATEGIES

Statement	N	% of Responses % Agree	% Disagree
The course material was what I expected when I enrolled in the course.	6	5(83%)	1(17%)
I would recommend this course to a beginning gardener.	6	6(100%)	
I would recommend this course to an experienced gardener.	5	2(40%)	3(60%)

A favourable attitude towards the classroom climate and instructor's presentation style will be seen in Table 66.

TABLE 66

OPINIONS ON THE TEACHING TECHNIQUES USED IN THE COURSE "INDOOR LANDSCAPING"

Statement	N	% of Responses	
		% Agree	% Disagree
Students were encouraged to share their horticultural experiences with the class.	6	6(100%)	
The instructor's presentation was easy to follow.	5	5(100%)	
There was enough class participation.	6	5(83%)	1(17%)
Attending class was a relaxing experience.	6	6(100%)	

In Table 67, the detailed analysis of student opinions on the teaching techniques used in the course shows an inadequate use of slides/films in the course.

TABLE 67

ASSESSMENT OF THE TEACHING TECHNIQUES USED IN THE COURSE

Teaching Technique	N	Not Used	Too Little	Just Right	Too Often
Class discussions	6	1(17%)	1(17%)	4(66%)	
Examples of Specimens, etc.	6	1(17%)	1(17%)	4(66%)	
Slides/films	6		6(100%)		
Laboratory	4	2(50%)	2(50%)		
Reference materials	4			4(100%)	
Lecture	6		2(44%)	4(66%)	
Field trips	6	3(50%)	3(50%)		
Demonstrations in class	5	1(17%)	2(33%)	2(50%)	

COURSE TIME ALLOCATION
(N=4)

In connection with the appropriateness of course time allocated for covering content, 3(75%) of the students indicated not enough time was allocated and 1(25%) found it adequate.

As shown in Table 68, all responses were favourable towards using the University as the course location.

TABLE 68

ATTITUDES TOWARDS COURSE LOCATION

Statement	N	% of Responses % Agree	% Disagree
The classroom was in a convenient location.	6	6(100%)	
Coming to the University was not a threatening experience.	6	6(100%)	

From the analysis of student motives for enrolling in the course in Table 69, it is apparent that there are significant differences in the amount of influence different notives have for encouraging participation. A grading scale, using the value ($\bar{x}$=1) did not influence decision to enrol in the course to ($\bar{x}$=5) strongly influenced decision to enrol in the course, was computed for the resuls. The students' strongest motive for enrolling in the "Indoor Landscaping" course were to "improve gardening skills" and "subject sounded interesting".

TABLE 69

MOTIVES FOR ENROLLING IN THE COURSE "INDOOR LANDSCAPING"

Motive	N	Mean	Grading Scale For Strength of Influence
Improve gardening skills	6	4.00	Strong Influence ($\bar{x}$=5)
Subject sounded interesting	6	4.00	
Keep current in my field	6	3.50	
To solve a specific problem	6	3.33	
Share ideas with other people	6	3.00	
Get away from daily routine	6	2.50	
Save money on gardening supplies and services	6	2.00	No Influence
Meet new people	6	1.83	($\bar{x}$=1)

*Analysis of Variance reveals an F Ratio of 2.15, $p<0.06$

COMPARISON OF INFLUENCE BETWEEN PAIRS OF MOTIVES

Due to the limited sample size, the Scheffe Post Hoc Comparisons have found all means to be part of the same homogenous subset.

Students' opinions on the practical and technical nature of the subject content are recorded in Table 70.

TABLE 70

ATTITUDES TOWARDS COURSE CONTENT

Statement	N	% of Responses	
		% Agree	% Disagree
The course material was not too technical.	6	6(100%)	
The course provided me with practical information.	6	6(100%)	

The detailed analysis in the questionnaire on topic "content newness and practicality" shown in Table 71 reveals that the mean of the responses concerning newness was 2.69 on a five-point scale. Concerning practicality of the course information, it will be noted that the mean of the responses was 2.89.

TABLE 71

NEWNESS AND PRACTICALITY OF COURSE CONTENT

Criterion	N	Mean	Grading Scale	
NEWNESS	6	2.69	Very New Material ($\bar{x}$=5) ←	Not New Material ($\bar{x}$=1)
PRACTICALITY	6	2.89	Refer Often to Course Material ($\bar{x}$=5) ←	Never Refer to Course Material ($\bar{x}$=1)

MEETING STUDENTS' OBJECTIVES

In connection with this course, 5(100%) respondents stated their objectives were met.

DISCUSSION:

The evaluation results for the course "Indoor Landscaping" provide useful insights into the strengths and weaknesses of the course. The main strengths of the course lie in the accurate description of the course content in the advertising material, and a convenient course location. Major weaknesses in the course were identified as low practicality of subject content, insufficient application of slides and films in the course, and not enough time was allocated to cover the lecture material.

4.3 EVALUATION RESULTS FOR THE COURSE, "INTRODUCTION TO HYDROPONICS"

Students indicated "time-scheduling" as being the major barrier to participation, as will be shown in Table 72.

TABLE 72

STUDENTS' REASONS FOR MISSING CLASSES

Reason	N	% of Responses
Course location	0	0%
Time scheduling	3	75%
Subject content	1	25%
Teaching techniques	0	0%
Other	0	0%
Total Responses	4	100%

Table 73 shows that the majority of students (83%) indicated that the course material was correctly described by the promotional material. The "Introduction to Hydroponics" course is strongly recommended for beginning(86%) and experienced (86%)gardeners.

TABLE 73

OPINIONS ON PROMOTIONAL STRATEGIES

STATEMENT	FREQUENCY	% OF RESPONSES % AGREE	% DISAGREE
The course material was what I expected when I enrolled in the course.	6	5(83%)	1(17%)
I would recommend this course to a beginning gardener.	7	6(86%)	1(14%)
I would recommend this course to an experienced gardener.	7	6(86%)	1(14%)

STRENGTHS OF THE TEACHING TECHNIQUES USED IN THE COURSE
(Interview data N=1)

Demonstrations in greenhouses, and the information on plant physiology and their needs were strong points in the course.

A favourable attitude towards the classroom climate and instructor's presentation style will be seen in Table 73.

TABLE 74

OPINIONS ON THE TEACHING TECHNIQUES USED IN THE COURSE "INTRODUCTION TO HYDROPONICS"

Statement	N	% of Responses	
		% Agree	% Disagree
Students were encouraged to share their horticultural experiences with the class.	5	3(60%)	2(40%)
The instructor's presentation was easy to follow.	6	6(100%)	
There was enough class participation.	6	5(83%)	1(17%)
Attending class was a relaxing experience.	7	7(100%)	

In Table 75, the detailed analysis of student opinions on the teaching techniques used in the course shows an inadequate use of slides/films.

TABLE 75

ASSESSMENT ON THE TEACHING TECHNIQUES USED IN THE COURSE

Teaching Technique	N	Not Used	Too Little	Just Right	Too Often
Class discussions	5	1(20%)	1(20%)	3(60%)	
Examples of Specimens, etc.	7		4(57%)	3(43%)	
Slides/films	7		4(57%)	2(29%)	1(14%)
Laboratory	7	5(72%)	1(14%)	1(14%)	
Reference materials	7		3(43%)	4(57%)	
Lecture	7		1(14%)	5(72%)	1(14%)
Field trips	7	6(86%)	1(14%)		
Demonstrations in class	7	2(29%)	3(42%)	2(29%)	

COURSE TIME ALLOCATION

In connection with the appropriateness of course time allocated for covering content, 3(43%) of the students indicated not enough time was allocated, 3(43%) found it adequate, and 1(14%) indicated too much time was spent.

As shown in Table 76, all responses were favourable towards using the University as the course location.

TABLE 76

ATTITUDES TOWARDS COURSE LOCATION

Statement	N	% of Responses % Agree	% Disagree
The classroom was in a convenient location.	7	7(100%)	
Coming to the University was not a threatening experience.	7	7(100%)	

From the analysis of student motives for enrolling in the course in Table 77, it is apparent that there are significant differences in the amount of influence different motives have for encouraging participation. A grading scale using the values ($\bar{x}$=1) did not influence decision to enrol in the course to ($\bar{x}$=5) strongly influenced decision to enrol in the course was computed for the results. The students' strongest motive for enrolling in the "Introduction to Hydroponics" course was because the subject sounded interesting and they wanted to improve their gardening skills.

TABLE 77

MOTIVES FOR ENROLLING IN THE COURSE
"INTRODUCTION TO HYDROPONICS"

Motive	N	Mean	Grading Scale For Strength of Influence
Subject sounded interesting	8	4.50	Strong Influence ($\bar{x}$=5)
Improve gardening skills	8	4.38	
To solve a specific problem	7	3.14	
Share ideas with other people	5	3.00	
Get away from daily routine	7	2.43	
Keep current in my field	6	2.33	
Save money on gardening supplies and services	7	2.29	No Influence
Meet new people	6	2.00	($\bar{x}$=1)

*Analysis of Variance reveals an F Ratio of 3.07, $p<0.01$

COMPARISON OF INFLUENCE BETWEEN PAIRS OF MOTIVES

The Scheffe Post Hoc comparison procedure did not statistically distinquish between the motives because of the small sample size.

REASON FOR COURSE ENROLLMENT
(Interview data N=1)
A student enrolled in the course in order to obtain general information on hydroponics.

Students opinions on the practical and technical nature of the subject content will be shown in Table 78

TABLE 78

ATTITUDES TOWARDS COURSE CONTENT

Statement	N	% of Responses % Agree	% Disagree
The course material was not too technical.	7	6(86%)	1(14%)
The course provided me with practical information.	6	4(67%)	2(33%)

The detailed analysis in the questionnaire on subject content newness and practicality shown in Table 79 reveals that the mean of the responses concerning newness was 3.23 on a five-point scale. Concerning practicality of the course information, it will be noted that the mean of the responses was 2.66.

TABLE 79

NEWNESS AND PRACTICALITY OF COURSE CONTENT

Criterion	N	Mean	Grading Scale	
NEWNESS	8	3.23	Very New Material ($\bar{X}$=5) ←	Not New Material ($\bar{X}$=1)
PRACTICALITY	8	2.66	Refer Often to Course Material ($\bar{X}$=5) ←	Never Refer to Course Material ($\bar{X}$=1)

USEFULNESS OF COURSE CONTENT
(Interview data N=1)

A student found some of the information new, but not useful enough.

MEETING STUDENTS' OBJECTIVES

In connection with this course, 6(75%) respondents stated that their objectives were met, while 2(25%) reported that their objectives were not met.

As will be seen in Table 80, two of the eight students were dissatisfied with the course because it did not provide them with enough information relevant to their horticultural problems.

TABLE 80

EXPLANATIONS OF WHY STUDENTS' OBJECTIVES
WERE NOT MET BY THE COURSE

1. I would have liked to see the course more detailed. Topics were only briefly discussed.

2. Too much time spent on basics. Botanic Garden course was more informative and to the point.

WEAKNESSES IN THE COURSE
(Interview data N=1)
There was too much technical information and not enough emphasis on commercially prepackaged fertilizers.

DISCUSSION:

The evaluation results for the course "Introduction to Hydrpononics" have identified strong and weak areas in the course. The strengths in the course were accurate descriptions of the course in the advertising material and a convenient course location. Time-scheduling was a major (75%) barrier to participation. Areas requiring improvement were the insufficient use of slides/films and the low practicality rating the course information received.

CHAPTER FIVE

RECOMMENDATIONS AND CONCLUDING STATEMENT

This evaluation study was effective in determining the quality of the Faculty of Extension's 1980-1983 Horticulture program. The purpose of the study was to obtain information from former students which would assist in determining the strengths and weaknesses in the following program components: motives for participation, promotional strategies, teaching techniques, time allocation, course location, and course content.

Literature relevant to adult education and program evaluation was reviewed. Stufflebeams's Context and Process evaluation models were useful organizers for the study. Both questionnaires and interview formats were constructed for the purpose of collecting opinions and judgments from the students. Data indicating inadequacies in the program were useful for modifying the program. The Context evaluation results for the program are presented in the form of recommendations for future instructional formats and time schedules, promotional strategies, and course locations. The Process evaluation results which identify a potential source of failure in the project are summarized in the recommendations for future course content and future teaching techniques.

Recommendations for the program are as follows.

RECOMMENDATIONS REGARDING FUTURE INSTRUCTIONAL FORMATS AND TIME SCHEDULES

Among the variety of factors evaluated by students as being possible barriers to participation, time-scheduling was the most frequently cited by the students. From the information collected on student preferences for time-scheduling, it appears that those courses which are offered twice a week or on Saturdays should be rescheduled to the more preferred format of evening sessions/once a week. The months of the year, January to April, and September to December, which the University offers courses are already optimum periods for horticultural courses. Therefore, no change in the choice of calendar months is recommended.

RECOMMENDATIONS REGARDING FUTURE PROMOTIONAL STRATEGIES

The current promotional strategies used by the University are rated by students as being very effective communication channels. Also, the promotional information has been assessed as being very accurate in its portrayal of course content and experience level of the course. Therefore, efforts for increasing enrolment should be directed in expanding the use of newspaper and brochure advertising.

RECOMMENDATIONS FOR FUTURE COURSE LOCATIONS

Students in all courses were satisfied with the courses being located at the University of Alberta.

RECOMMENDATIONS REGARDING FUTURE TEACHING TECHNIQUES

The classroom teaching techniques students indicate should be frequently employed in any course are lecture, reference materials, and examples. How successfully instructors employed certain teaching techniques varied among the courses. Therefore, recommendations concerning future teaching techniques are course specific.

1. "Beginning Gardening and Landscaping"

   Class discussions and field trips should be used more frequently.

2. "Control of Home and Garden Insect Pests"

   Examples of specimens should be used more frequently in the classroom.

3. "Greenhouse Design, Construction and Management I"

   More field trips should be used in instruction.

4. "Greenhouse Design, Construction and Management II"

   Laboratories should be added to the course.

5. "How To Develop A Green Thumb With Houseplants"

Student opinion indicated that all the teaching techniques were used effectively in the course.

6. "Indoor Landscaping"

Student opinion indicates that all the teaching techniques were effectively used in the course.

7. "Introduction to Hydroponics" Examples of speciments, slides/films and class discussions should be used more frequently during the class.

RECOMMENDATIONS REGARDING FUTURE COURSE CONTENT

The standard for measuring subject content effectiveness is how it met students' motives for enrolling in the course. In all the courses, the students were goal-oriented towards learning as shown by the high rating the motive "improve gardening skills" (a minimum rating of 4.00 on a five-point influence scale) received from the students. Therefore, a program area which could be improved was the subject content's relevance to the student's specific horticultural problems, since it only ranged from a low 2.66 to 3.18 on a five-point frequency of use scale. Future course outlines would better serve their clients if they were more flexible and open to revision by incoming classes in order to maximize the

benefit students receive from the co. se.

CONCLUDING STATEM: :T

This evaluation study was valuable be) its immediate and intended purpose of assisting the Faculty of Extension in its decision-making process. The data on adult learner's motives, preferences, and needs support much of the adult education literature. Following the trends in other adult education studies, the students in the Horticulture program were strongly motivated by pragmatic reasons to participate in further education.

The promotional material attracted students because it offerred to meet the student's particular horticultural problems or interests. The Horticulture Extension Program was well-executed and provided students with some useful information. However, it would have been more successful in helping adults meet their horticultural needs if the program had a stronger emphasis on the developmental approach rather than informational and institutional.

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APPENDIX 1

DIRECTIONS: Please fill in the questionnaire by either CIRCLING the number that best represents your opinion, or by writing information when requested. There are no right or wrong answers, it is your opinion that we value.

***** EXAMPLE ONLY *****

How effectively do each of the following items inform you about new horticultural courses?

Circle one number for EACH and EVERY item in this question (items a-e).

	Not Effective		Effective		Very Effective
a. Hardware Stores	1	(2)	3	4	5
b. Husband/wife	1	2	3	(4)	5
c. Government Publications	1	2	3	4	(5)
d. Muttart Conservatory	(1)	2	3	4	5
e. District Horticulturalist	1	2	3	4	(5)

office use only

1 1/2

A. BACKGROUND INFORMATION

(A1.) How effectively do <u>each</u> of the following items inform you about new horticultural courses?

Circle one number for EACH and EVERY item in this question (items a-j).

	Not Effective				Very Effective	
a. Radio	1	2	3	4	5	7
b. Newspaper	1	2	3	4	5	8
c. Brochures	1	2	3	4	5	9
d. Television	1	2	3	4	5	10
e. Garden Centres.	1	2	3	4	5	11
f. Horticulture Club	1	2	3	4	5	12
g. University "Folio" newspaper	1	2	3	4	5	13
h. Shopping Centre Bulletin Board.	1	2	3	4	5	14
i. Friends/neighbours.	1	2	3	4	5	15
j. Other (specify) _____	1	2	3	4	5	16

3 4 5

(A2.) How did you first learn about the course? (write in response)

_____ 17, 18

(A3) How much did <u>each</u> of the following reasons influence you to take the course?
Circle one number for EACH and EVERY item in this question (items a-i).

	Don't Recall	No Influence				Strong Influence	
a. Meet new people	0	1	2	3	4	5	19
b. Keep current in my field	0	1	2	3	4	5	20
c. To solve a specific problem	0	1	2	3	4	5	21
d. Share ideas with other people	0	1	2	3	4	5	22
e. Save money on gardening supplies and service	0	1	2	3	4	5	23
f. Get away from daily routine	0	1	2	3	4	5	24
g. Improve gardening skills . . .	0	1	2	3	4	5	25
h. Subject sounded interesting	0	1	2	3	4	5	26
i. Other(specify) _____	0	1	2	3	4	5	27

(A4) Were your objectives for taking the course met? Yes (1) No (2) 28
Circle the number of your answer

If No, which objectives were not met? (write in response)

_____ 29,

_____ 30

B. SCHEDULING INFORMATION

(B1.) How many sessions did you attend?

Circle the number of the best estimate.

All Of Them	Not All But Most Of Them	Half Or Less Than Half
1	2	3

31

If you did not attend all the sessions, circle ALL applicable reasons below.

32-36

Course location 1

Time scheduling 2

Subject content 3

Teaching methods. 4

Other (specify)

_____ 5

(B2.) How adequate was the total time scheduled for the course?

Circle the number of the best estimate

No opinion	Adequate	Too much time	Not enough time
0	1	2	3

37

(B3.) Which months of the year are not practical for you to attend horticultural courses? (list them below)

38.
39

_____

(B4) If you were to attend another horticultural course, how preferable for you is each of the following formats?

Circle one number for EACH and EVERY item in this question (items a-i).

	Not Preferred				Strongly Preferred	
a. Evening sessions (once per week)	1	2	3	4	5	40
b. Evening sessions (twice per week).	1	2	3	4	5	41
c. All-day Saturday workshops	1	2	3	4	5	42
d. 3-hour Saturday course	1	2	3	4	5	43
e. 3-hour Sunday course	1	2	3	4	5	44
f. Correspondence/ Independent Study kits	1	2	3	4	5	45
g. Educational Television	1	2	3	4	5	46
h. Educational Radio	1	2	3	4	5	47
i. Other (specify) _____	1	2	3	4	5	48, 49

C. COURSE CONTENT INFORMATION

C1. How new to you was the course information on each of the following topics? Circle one number for EACH and EVERY item in this question (items a-i).

	Didn't Attend/ Don't Recall	Not New				Very New	
a. Small fruits and tree fruits	0	1	2	3	4	5	50
b. Soils and soils improvement	0	1	2	3	4	5	51
c. Fertilizers and general garden culture	0	1	2	3	4	5	52
d. Insect pests and their control	0	1	2	3	4	5	53
e. Garden plant diseases and their control	0	1	2	3	4	5	54
f. Annual flowers	0	1	2	3	4	5	55
g. Herbaceous perennials and house plants	0	1	2	3	4	5	56
h. Vegetable gardening	0	1	2	3	4	5	57
i. Establishing and maintaining the home lawn	0	1	2	3	4	5	58
j. Trees, shrubs and ground covers	0	1	2	3	4	5	59
k. Home landscaping	0	1	2	3	4	5	60
l. Greenhouse Tours	0	1	2	3	4	5	61

C2. What useful skills or techniques did you learn from the course? (write in response)

62, 63

_____

(C3.) How often do you refer to the information taught in each of the following topics? Circle one number for EACH and EVERY item in this question (items a-l).

	Didn't Attend/ Don't Recall	Never		Sometimes		Often	
a. Small fruits and tree fruits	0	1	2	3	4	5	6
b. Soils and soil improvement	0	1	2	3	4	5	7
c. Fertilizers and general garden culture	0	1	2	3	4	5	8
d. Insect pests and their control	0	1	2	3	4	5	9
e. Garden plant diseases and their control	0	1	2	3	4	5	10
f. Annual flowers	0	1	2	3	4	5	11
g. Herbaceous perennials and house plants	0	1	2	3	4	5	12
h. Vegetable gardening	0	1	2	3	4	5	13
i. Establishing and maintaining the home lawn	0	1	2	3	4	5	14
j. Trees, shrubs and ground covers	0	1	2	3	4	5	15
k. Home landscaping	0	1	2	3	4	5	16
l. Greenhouse tours	0	1	2	3	4	5	17

(C4.) What topics would you add to the list in question (C3)? (write in response)

18.
19

D. INSTRUCTIONAL INFORMATION

D1. In your opinion, how often were each of the following teaching methods used? Circle one number for EACH and EVERY item in this question (items a-i).

	Don't Recall	Not Used	Too Little	Just Right	Too Often	
a. Class discussions	0	1	2	3	4	20
b. Examples of specimens, chemicals, materials	0	1	2	3	4	21
c. Slides/films	0	1	2	3	4	22
d. Laboratory(hands-on)	0	1	2	3	4	23
e. Reference materials	0	1	2	3	4	24
f. Lecture	0	1	2	3	4	25
g. Field trips	0	1	2	3	4	26
h. Demonstrations in class	0	1	2	3	4	27
i. Other (specify) _____	0	1	2	3	4	28

D2. How often should each of the following teaching methods be used in the course? Circle one number for EACH and EVERY item in this question (items a-i).

	No Opinion	Never		Sometimes		Often	
a. Class discussions	0	1	2	3	4	5	29
b. Examples of specimens, chemicals, materials	0	1	2	3	4	5	30
c. Slides/films	0	1	2	3	4	5	31
d. Laboratory(hands-on)	0	1	2	3	4	5	32
e. Reference materials	0	1	2	3	4	5	33
f. Lecture	0	1	2	3	4	5	34
g. Field trips	0	1	2	3	4	5	35
h. Demonstrations in class	0	1	2	3	4	5	36
i. Other (specify) _____	0	1	2	3	4	5	37

(D3.) What are your opinions about the course?

Circle one number for EACH and EVERY item in this question (items a-l).

	No opinion	Strongly Agree	Agree	Disagree	Strongly Disagree	
a. The classroom was in a convenient location.	0	1	2	3	4	38
b. Coming to the University was not a threatening experience	0	1	2	3	4	39
c. Students were encouraged to share their horticultural experience with the class.	0	1	2	3	4	40
d. The instructor's presentation was easy to follow.	0	1	2	3	4	41
e. There was enough class participation.	0	1	2	3	4	42
f. Attending class was a relaxing experience.	0	1	2	3	4	43
g. The course material was what I expected when I enrolled in the course.	0	1	2	3	4	44
h. The course material was not too technical.	0	1	2	3	4	45
i. The course provided me with practical information	0	1	2	3	4	46
j. The course increased my interest in horticulture	0	1	2	3	4	47
k. I would recommend this course to a beginning gardener	0	1	2	3	4	48
l. I would recommend this course to an experienced gardener.	0	1	2	3	4	49

(D4.) Please use the following space to suggest other horticultural topics you would like information on. 50, 51

THANKS AGAIN FOR YOUR TIME AND EFFORT!

APPENDIX 2

INTERVIEW SCHEDULE

Hello, my name is Marion Giles and I am calling on behalf of the Faculty of Extension about the _____ course you attended at the University of Alberta.

We are trying to improve future courses by contacting former students and asking their opinions about the course they attended. We will forward a copy of the executive summary when the study is completed.

All of your opinions will be confidential. Would you mind sparing 10 minutes of your time to answer a few questions?

1. Please list some of your reasons for taking the course.

2. What were some of the strengths in the course?

3. What were some of the weaknesses in the course?

4. How useful has the course information been in your gardening practices?

APPENDIX 3

UNIVERSITY OF ALBERTA EXTENSION
AGRICULTURE - FORESTRY

June 23, 1983

Mr. Respondent
500 Disney Street
Edmonton, AB
T2J 3M5

Dear Mr. Respondent

You have been selected to participate in a survey sponsored by the Faculty of Extension and conducted by an external researcher. The purpose of this survey is to evaluate the effectiveness of our present horticulture program to ensure that courses are as useful as possible to our students.

Enclosed is a questionnaire concerning the horticulture course you attended at The University of Alberta. We realize that this may be a busy time of the year for you, but would be very grateful if you would fill in the questionnaire even if you did not attend all the sessions. It is important for us to obtain as many responses as possible and the more information we receive the more successful will be our attempts to improve the program.

All information you provide will be completely confidential. Would you please return the questionnaire in the self-addressed, pre-stamped envelope by July 15, 1983. If you have any questions, please give me a call at 437-3913.

A copy of the executive summary will be forwarded to you upon completion of the study.

Thank you very much for your assistance.

Sincerely,

Marion Giles
Evaluation Coordinator

FACULTY OF EXTENSION, THE UNIVERSITY OF ALBERTA, CORBETT HALL, EDMONTON, CANADA T6G 2G4 (403) 432 3029

UNIVERSITY OF ALBERTA EXTENSION
AGRICULTURE - FORESTRY

July 20, 1983

Mr. Respondent
500 Disney Street
Edmonton, AB
T2J 3M5

Dear Mr Respondent

Returns from the horticulture survey sponsored by The University of Alberta are coming in very well. Unfortunately, we have not received yours yet. If you have not returned your questionnaire, please complete the enclosed questionnaire and return it in the self-addressed, pre-stamped envelope as soon as possible.

We would really appreciate receiving your questionnaire so that we can proceed with the analysis.

Thanks again for your assistance.

Sincerely,

Marion Giles
Evaluation Coordinator

FACULTY OF EXTENSION, THE UNIVERSITY OF ALBERTA, CORBETT HALL, EDMONTON, CANADA T6G 2G4 (403) 432-3029